DOCUMENT RESUME

ED 114 369 SP 009 610

AUTHOR Bredange, Gunlog; Tingsell, Jan-Gunnar
TITLE Transfer and Adaptation to Swedish Teacher Training of Minicourse 1: Effective Questioning.
PUB DATE Jun 74
NOTE 113p.
AVAILABLE FROM Pedagogiska Institutionen, Lararhogskolan i Goteberg, Ovre Husargatan 34, S-413 14 Goteborg (Free)

EDRS PRICE MF-$0.76 HC-$5.70 Plus Postage
DESCRIPTORS Cognitive Processes; Higher Education; Inquiry Training; International Education; International Programs; Microteaching; *Questioning Techniques; *Short Courses; Student Participation; *Student Teachers; *Teacher Education; *Teaching Methods; Teaching Skills
IDENTIFIERS *Minicourses

ABSTRACT

This report gives an account of the Swedish part of an international transfer project with the aim of adapting teacher training systems based on microteaching for use in member countries of the Organization for Economic Cooperation and Development. An American minicourse, "Effective Questioning," was adapted to and tested for Swedish teacher training. The course represented a method for skill training that aims at stimulating student participation, making students verbally active, having them use higher cognitive processes, and reducing the amount of teacher talk in favor of student participation. The testing of the minicourse took place during the autumn term in 1973 with 32 student teachers on their practice term. A control group of 10 student teachers was included. The hypotheses set forth to test the minicourse were: (1) that the minicourse skills would be used to a greater extent after the course, (2) that there would be no difference on the whole between pre- and post-recordings in the control group, and (3) that there would be no difference on the whole between student teachers at junior and middle levels in mastering the minicourse. Hypotheses two and three were confirmed. As for hypothesis one, there was an obvious change in more than half of the minicourse skills, while the rest of the skills in most cases showed tendencies in the expected direction.
(Author/RC)

****
* Documents acquired by ERIC include many informal unpublished *
* materials not available from other sources. ERIC makes every effort *
* to obtain the best copy available. Nevertheless, items of marginal *
* reproducibility are often encountered and this affects the quality *
* of the microfiche and hardcopy reproductions ERIC makes available *
* via the ERIC Document Reproduction Service (EDRS). EDRS is not *
* responsible for the quality of the original document. Reproductions *
* supplied by EDRS are the best that can be made from the original. *
****

ED114369

Project DPA
Didactic Process Analysis

U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

TRANSFER AND ADAPTATION TO SWEDISH TEACHER TRAINING OF MINICOURSE 1: EFFECTIVE QUESTIONING

by

Gunlog Bredange & Jan-Gunnar Tingsell

Pedagogiska institutionen
Lärarhögskolan i Göteborg

Juni 1974

009 610

PEDAGOGISKA INSTITUTIONEN
Lärarhögskolan i Göteborg
Övre Husargatan 34
413 14 GÖTEBORG
Tfn 031/17 81 60

U

ENGLISH SUMMARY

Gunlög Bredänge - Jan-Gunnar Tingsell

TRANSFER AND ADAPTATION TO SWEDISH TEACHER TRAINING OF MINICOURSE 1: EFFECTIVE QUESTIONING

Uppsats nr 25
June 1974
83 pages + appendices

The report gives an account of the Swedish part of an international transfer project with the aim of adapting teacher training systems based on microteaching for use in member countries of the OECD.

At the request of the Swedish National Board of Education a training system has been adapted to and tested for Swedish teacher training, namely the American minicourse 1: Effective questioning. This is a method for skill training that aims at stimulating student participation, making the students verbally active, having them use higher cognitive processes and reduce the amount of teacher talk in favour of student participation.

The testing of the minicourse took place during the autumn term in 1973 with 32 student teachers on their practice term. 20 student teachers were teaching at the middle level of the Swedish 9-year compulsory school, and 12 at the junior level. A control group of 10 student teachers was included.

The following hypotheses were set forth:

a) The minicourse skills will be used to a greater extent after the course.
b) There will be no difference on the whole between pre- and post-recordings in the control group.
c) There will be no difference on the whole between student teachers at junior and middle levels in mastering the minicourse skills.

Hypotheses b) and c) were confirmed. As for a) there was an obvious change in more than half of the minicourse skills, while the rest of the skills in most cases showed tendencies in expected direction. An inquiry which was answered by the student teachers on completing the course, showed that the minicourse as a contribution to teacher education has met with an extraordinarily positive response.

The uppsats can be ordered free from:

Pedagogiska institutionen
Lärarhögskolan i Göteborg
Övre Husargatan 34

S-413 14 Göteborg

TABLE OF CONTENTS

List of Tables
List of Figures

Chapter 1		Introduction and background	1
	1:1	Scope of the transfer project. Choice of minicourse	1
	1:2	Rationale	4
Chapter 2		Objectives	5
	2:1	The objectives of the international transfer project	5
	2:2	The objectives of the Swedish experiments	6
Chapter 3		Minicourse 1: Effective questioning	8
	3:1	Description of the original material	8
	3:2	Deliberations upon the adaptation of the minicourse to Swedish teacher training	10
	3:3	Translation of the handbook and the programme scripts	12
	3:4	Revision of handbook and programme scripts	14
	3:5	Programme production	16
Chapter 4		Description of the technical equipment	19
	4:1	Criteria for suitable videotape equipment	19
	4:2	General comments	21
	4:3	Attitudes towards the technical equipment	23
	4:4	Production of the instructional and model lessons	23
Chapter 5		Pilot study	25
Chapter 6		Planning of the main field test	29
	6:1	Considerations about the choice of subject	29
	6:2	Control group. Reasons for decisons around the control group	32
	6:3	Design	33
	6:3:1	Hypotheses	34
	6:3:2	Procedure	35
	6:4	Subjects	35
	6:5	Schedule for the main field test	37
	6:6	The coordinator's tasks	38
Chapter 7		The main field test	41
	7:1	The pre-recordings	41
	7:2	The conducting of the minicourse	42
	7:3	The post-recordings	44
	7:4	Questionnaire to the student teachers	45
Chapter 8		Evaluation of the pre- and post-recordings	47
	8:1:1	Plan for observations	50
	8:1:2	Practical arrangements	50
	8:1:3	Directions in the analysis	50

Chapter	8:2	Stability and inter-observer agreement	51
	8:3	Revision and estimation methods	52
Chapter	9	Results	55
	9:1	Comparison between pre- and post-recordings of the experiment group	55
	9:2	Comparison between the experiment and control groups	58
	9:3	Comparison between the Swedish and the American minicourse studies	63
	9:4	Comparison between the participants on the junior and middle levels	64
	9:5	Results of the inquiry to the participants in the course	65
Chapter	10	The minicourse in teacher education	75
	10:1	At what time during the education should the minicourse be offered?	75
	10:2	How can the minicourse be integrated with other parts of the teacher education? ...	76
	10:3	Which student teachers should be given the opportunity of taking the minicourse	78
	10:4	With the present resources, how many student teachers can take the course?	80
	10:5	Final views	81

Appendices

References

List of Tables

6:1	Distribution of subjects on trial condition, level and sex	36
6:2	Distribution of subjects on grades	37
8:1	List of variables for the minicourse project	48
8:2	Agreement and stability measures for the analysed skills. Product moment correlation	52
9:1	t-test of the difference between pre- and post-means for the experiment group	55
9:2	Covariance analysis. Experiment - control group	59
9:3	Comparison between Swedish and American results	63
9:4	Covariance analysis. Junior - middle level	65

List of Figures

3:1	Teacher activities during a minicourse instructional sequence	9
4:1	Placement of the TV-equipment in the microteaching clinic	22
4:2	Placement of the TV-equipment during pre- and post-recording	22
6:1	Time schedule for main field test	38
6:2	Map showing location of practice schools during main field test	39
9:1 a-c	Means for the experimental and the control groups adjusted for differences in the pre-recordings	60

1 INTRODUCTION AND BACKGROUND

During the last two years a team of researchers at the Gothenburg School of Education has been working on the task of adapting to Swedish conditions an American teacher training system. The work of the team as well as the results of the Swedish testing of the material are described in this report. Because the Swedish adaptation takes place within the framework of an international transfer project, certain references to that project are made. For example, an account is given of both the objectives of the transfer project and of the investigation plan which was suggested as common to the different members of the project. Those results of which we give account here refer to the Swedish investigation. It has been found impossible to make comparisons with other investigations, as the results from these will not become available until later. Comparisons with the results from the American testing of the original material will, however, be made.

1.1 Scope of the transfer project. Choice of minicourse

In 1972 the Department of Educational Research at the Gothenburg School of Education was charged by the Board of Education and the Ministry of Education with carrying out the Swedish part of an international transfer project. The promoter of the transfer project was OECD/CERI (Center for Educational Research and Innovation), and a number of OECD countries have joined the project. Besides Sweden, also Holland, Great Britain and West Germany are taking part.

The material which CERI chose as suitable objects for a transfer investigation are four so called minicourses. Each country which joined the project was asked to choose one of the minicourses for testing. Different levels of membership were presented as conceivable - from full participation to observer participation. All the national projects have joined under the former type of participation and are therefore taking part on a full scale. All of the

minicourses have been produced for inservice and preservice teacher training by the Far West Laboratory for Educational Research and Development, Berkeley, California.

Far West Laboratory has produced and developed around twenty such courses with the common characteristic that each one

- is intended for training different teaching skills
- is constructed around micro-teaching (i.e. teaching of a few pupils for only 5 - 10 minutes)
- demands limited teacher-activity which is stated in hours
- has been carefully tested, and a large amount of research data is available for comparative purposes
- is intended to function without any other guidance than that which is given in the material itself.

CERI chose for testing those four courses which were most thoroughly tested and for which comparative studies have already been made. The minicourses which were then recommended were the following:

Minicourse 1	Effective questioning: elementary level
Minicourse 9	Higher cognitive questioning
Minicourse 8	Organizing independent learning: primary level
Minicourse 15	Organizing independent learning: intermediate level.

The scope of the collected data for these four courses is broadest for minicourse 1 and narrowest for minicourse 15. The course can be adapted to both inservice and preservice teacher training. They have, however, primarily been used for inservice teachers and it is in connection with the latter that most of the data has been collected.

The Swedish group has chosen to adapt and test minicourse 1: Effective questioning. The reasons for this choice were that the course was well tested; that it met a need for skill training; and that the contents of the course were not culture-bound. The background for the last statement is a desire to open the possibilities for a Scandinavian exchange.

The course trains teaching skills which aim at stimulating pupils to increased participation, at making them verbally more

active, at having them use higher cognitive processes and at decreasing the amount of teacher talk in favour of pupil participation. There is here a question of those skills it appears more and more urgent to pay attention to in Swedish teacher-training. The importance of activating pupils in this way is repeatedly pointed out in the Curriculum for the compulsory school (1969). A few quotes can elucidate this. "Those qualities which should particularly been kept in sight are the clarity and order of thought, the ability to test information both critically and independently and to resist tendentious influence, to analyse, compare and to summarize." (p 13) "The adults in the school must always be ware of the risk that contact with young people can turn into a monologue, that there may never be time for a constructive exchange of ideas. The dialogue between teacher and pupil should always be possible during the daily work." (p 26) A Swedish investigation from the DPA-project (Bredänge-Odhagen 1972) found in a survey of the usual classroom teaching situation that there existed obvious shortcomings in this respect.

For example, it was observed that pupil behavior such as listen and observe was in an obvious majority, while the most usual teacher activities were to lecture and to ask questions. As for the questions, these were in Swedish, social studies and religion predominantly simple factual questions which demanded solely memorising on the part of the student.

Minicourse 1 was seen as one aid for remedying these shortcomings. In choosing this minicourse for Swedish testing it was considered of great importance to underline the fact that the course does not treat the matter of question-technique in the norrower sense, something which the title Effective questioning could possibly imply. The minicourse has therefore been given the name Elevaktiverande samtalsteknik. (Pupil activating discussion technique).

It can be of interest to note that minicourse 1 has been chosen for adaptation in England, Holland and West Germany also. In these countries, more than one minicourse is being adapted. In England as well as in Holland both courses 1 and 9 are being tested

and in West Germany course 1 and parts of number 15 are being tested. As a test group Sweden has chosen studentteachers, while in other countries testing is being carried out with both inservice and preservice teachers.

1.2 Rationale

The rationale for the transfer-project is that international transfer of developed and tested learning systems can offer a variety of benefits. It can be stated, for example, that the original development and production costs are so high that it can be economically desirable to use tested educational systems to as great extent as possible. In addition, a more rational use of manpower and material resources could be derived if parts of planning and development could be carried out on a cooperative basis. For future considerations of the transfer of teaching aids it is surely of great interest that the transfer process itself is studied systematically. The goal is, to get, as a result of the international transfer project, a manual which could be used for the transfer of other teaching aids. This manual could describe in detail the adaptation process, point out the problems which might be encountered, give guidelines for the testing and evaluation of teaching aids as well as suggest procedures for the planning and implementation of future cooperative projects of a similar type.

It does not, however, fall within the framework of this report to go into detail concerning these types of problems. The account will from here on restrict itself principally to the Swedish testing and considerations made in connection with the result of that testing.

2 OBJECTIVES

As has been mentioned earlier the transfer project has worked with two-fold objectives, partly such objectives as especially concern the international part, partly such as are specific for the Swedish experimentation. For the sake of completeness, the objectives of the international transfer project will be rendered account of, even if, as was mentioned in Chapter 1, its results do not fall within the framework of this report. When the different national projects are completed, a final report will be published by CERI. This report will comprise of those problems which have been met while adapting the minicourses to national conditions; an account of the possibilities for transfer to different educational sections; a discussion of different comparative aspects as well as an account of the transfer which has taken place from one country to another.

2.1 The objectives of the international transfer project

The more detailed guidelines for the international project (The International Transfer of Micro-teaching Materials) were drawn up at a conference in Stirling, Scotland in May of 1972. The participants in this conference were partly European experts in micro-teaching, partly representatives for Far West Laboratory which had produced and developed the present material. In a report from this conference (CERI/TLS 72.01 - Transfer of curriculum development projects and learning systems) account is given for the following objectives of the transfer project:

1. To adapt teacher training systems for use in member countries of the OECD. These systems are, as has been mentioned, the minicourses based upon micro-teaching as a method and with the goal of developing different teaching skills.

2. To test the adapted minicourses and to compare with existing data.

3. To study and document the problems involved in transfer in such a way that the adaptation process is clearly described; that the conceivable problems are recognized, that suggestions for procedures and strategies are given so that these can be followed in the planning and carrying out of future cooperative projects.

The project is planned to test

a) Transfer within countries representing a varying range of previous experience in micro-teaching.
b) Transfer of microteaching as a technique for building teacher-oriented skills.
c) Transfer of microteaching as a technique for developing learner-oriented skills.

2.2 The objectives of the Swedish experiments

When Sweden began considering the idea of participating in the CERI-project, the possibility of developing in this way a learning system for use in teacher training was seen. The following specific objectives were therefore given for the Swedish testing.

1. To adapt and produce a learning system (minicourse) to be used in teacher training. This development work should, if the results were good, be able to stimulate the continued development of similar methods and systems.

2. To test the learning effects of a minicourse in teacher training.

3. To point up the practical pre-requisites for a more general use of the minicourse as a teaching aid in teacher training. For instance the following questions were asked:

- at what time during the training should such minicourses most suitably be offered,
- how many student teachers can with prior resources follow through the course,
- which student teachers should be given the possibility of taking part in the course,

- how would the course be integrated with other parts of the training, etc.

Most of these questions can not be elucidated in any other way than by going through the considerations and discussions with those involved, something which this report will also try to give an account of.

4. To study the transfer process in connection with the Swedish development of teaching aids.

The report will, from now on, restrict itself principally to an account of the Swedish experiments, those results which have come forth and those discussions which took place in connection with the questions which were mentioned above.

3 MINICOURSE 1: EFFECTIVE QUESTIONING

The minicourse has in its Swedish version been given the name Elevaktiverande samtalsteknik (Pupil-activating discussion technique). It was considered that direct translation of the original title might too much make one think of questioning-technique in a more limited sense, something which would in this case have been misleading. The intention of the course is instead to train student teachers' ability to make the pupils verbally more active, to stimulate them to increased participation in classroom discussion and to make them use higher cognitive processes. Those skills which are trained are therefore designed for situations where the pupils are wanted to manipulate acquired knowledge rather than recite it back, and not for presenting new material.

3.1 Description of the original material

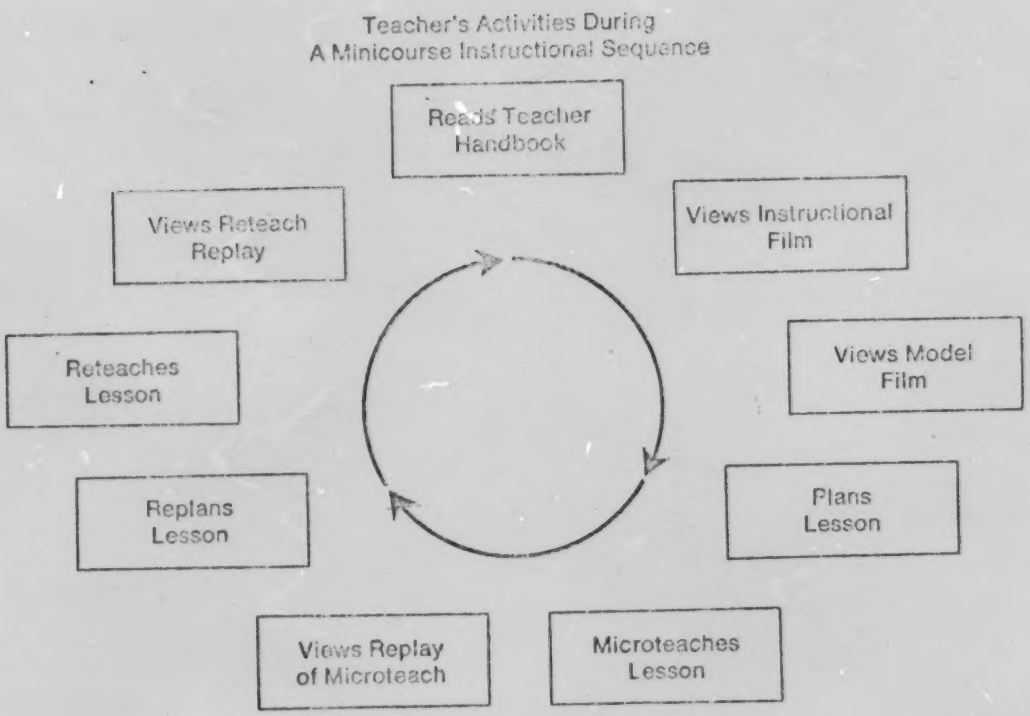
The original American version of minicourse 1 has existed for commercial use since 1970. How it was produced, tested and revised is described in detail in The minicourse: a Micro-teaching Approach to Teacher Education (Borg et al 1970).

The minicourse is self-instructing and consists of a number of TV-programmes on video-tape, which partly presents those skills which are to be trained and partly shows model-lessons where the skills are used. A teacher handbook also comes with the course and gives further information about the skills and gives the theoretical background for them. In the handbook instructions are given for the different micro-teaching sessions and self-evaluation forms for the evaluation of them.

The course is divided into four instructional sequences, each one of which treats three teaching skills. Each instructional sequence demands three days. The first day is spent on instruction by the video-tapes and the handbook of those three skills which are to be trained. The microteach lesson is then prepared, that is a short lesson of about 5-10 minutes with a small group of pupils,

in which the three skills of that instructional sequence are used. On the second day the micro-teaching is done and at the same time as it is recorded on video-tape. Afterwards, the micro-teaching lesson is evaluated according to instructions which are given in the handbook. On the basis of this evaluation the micro-teaching lesson is revised. The third day is spent on the revised lesson(the reteach lesson) and on the evaluation of it. After that one instructional sequence is finished.

This tree-day sequence can be illustrated in the following way.



In addition the course begins with a practice sequence which only takes two days and is intended to provide information about the course and to prepare for the regular instructional sequence.

Evaluation of the different micro-teaching sessions is made possible through the fact that each lesson is recorded on video-tape by the student teacher himself. Consequently it is necessary for the student teacher to be able to operate technical equipment consisting of TV-camera, video-tape-recorder and a TV-set. Therefore, before the beginning of the course, instructions in the operating of this apparatus are given by a coordinator. The task

for the coordinator is also to administrate the course and to aid the student teacher in case of problems of a practical nature. In the American material there is a special handbook for these coordinators with, among other things, a trouble-shooting list for the technical equipment.

3.2 Deliberations upon the adaptation of the minicourse to Swedish teacher training

When the decision had been made to take part in the transfer project with a testing of minicourse 1, there arose a number of questions of immediate interest, which must be answered before work could begin. One such question was if the course from a Swedish point of view should be considered first of all for a course in preservice training or if it should also be so worked out as to be adaptable to inservice training. In its original version the minicourses are used first and foremost for inservice training. But from the Swedish point of view it became apparent from the very onset that the investment in the minicourse was being made with the intention of developing a teaching aid for use in preservice training.

It was therefore necessary to consider what consequences on the adaptation there would be if the test group should consist of student teachers. A more detailed account of these consequences is rendered in the following.

A contiguous problem was for which categories of student teachers the course should be worked out. The original version of the course was intended for the elementary level with pupils aged 10-12. It is pointed out, however, (CERI 1972) that the course fits all age-groups, which is the reason why the Swedish testing was planned to encompass both junior, middle and senior levels of the Swedish compulsory school. On further consideration, however, the senior level was ruled out. The determining factor in this decision was not that the contents of the course would not be suitable for the senior level, but that adaptation of the course for student teachers in academic subjects met with practical

problems of a sort which could not be solved with those resources available.

With those words we now find ourselves at considerations of the practical pre-requisites for adapting a minicourse. The reason that the assignment to work out this adaptation was given to the Department of Educational Research at the Gothenburg School of Education, was that there were at the department manpower and material resources which could be taken advantage of. There were, for example, an ITV-department with a well-equipped TV-studio, where programme production could be placed. The research project MT (Micro Teaching) had already existed at the department for some years, for which reason the transfer project could use both the wide experience of micro-teaching as well as the necessary technical equipment. Because self-observation and self-analysis have been central parts of the MT project (Brusling & Tingstell 1973), there were here several points of interest in common, which were of great value. Another research project which was going on, DPA - Didactic Process Analysis - was going to start an applied phase with the aim of developing new methods in teacher training, and this should be done after an analytical phase with surveys of the teaching process and its influence and effect factors. There were even here valuable resources available to the transfer project. The choice of minicourse 1 for testing was made partly against the background of what had been found in the way of teaching patterns during the analytical phase of the DPA-project.

The time-schedule which was set up in the suggested investigation plan was another problem on which the team had to make a decision.

From the very beginning it became apparent that the time-schedule on certain points had to be greatly modified. The testing of the minicourse was planned for the Swedish project to be carried out with junior and middle level student teachers during their practice term. In the present case a autumn term was available for carrying out the main field study. It became obvious that the geographical spread of the practice schools made a concentration of the testing impossible. Instead, it had to be carried out in three

turns, which on the other hand could only be carried through if at least two individuals for the experimental group could be found at the same school.

Another problem which had to be met was how to find a substitute teacher. The minicourse is built around micro-teaching, that is to say one teaches a small group of pupils during a short period. Consequently it is necessary to "borrow" a few pupils from one class, and another teacher is needed to take over the rest of the class. For the student teachers on their practice term the supervisor was such a substitute teacher, who had one third of the lessons in the class, which the student teacher normally was responsible for.

In concluding, we can say that there were then rather good prerequisites that the testing of the minicourse would be carried out. On those premises which were given - that is, the adaptation of the course to preservice training, concentration to junior and middle level teacher training, student teachers on their practice term as subjects and the use of resources which were already available - work could now begin.

3.3 Translation of the handbook and the programme scripts

The different national transfer projects were recommended by CERI to follow basically the same investigation plan, in order to maximize possibilities for comparing the different tests. The investigation plan, which also includes an estimation of the calculated time to be used, has been worked out by Dr. B Ward at Far West Laboratory and was presented for the different national projects in the report CERI/TLS 72.01.

The general recommendation in the question of translation was that a discussion should be started from the available material - i.e. the handbook and the programme scripts - and to decide if certain principle changes were necessary and, if so, which. That required of course, that changes should from the very onset be made regarding the content of the classroom examples and the dialogues. These changes in the contents were so much more

urgent for the Swedish project as the area of use had been extended to include even the junior level.

In order to make decisions in questions regarding principle changes, a direct translation of the handbook was made without any modifications. Using this literal translation as a basis, certain desirable changes were then made. In order to give some idea of how and where these modifications were made, it might be appropriate to give an account of how the handbook and the scripts are constructed.

As has been mentioned earlier, the minicourse is divided into four instructional sequences, each one of which treating three different teaching skills. Each sequence is gone through according to figure in page 9. The first day is dedicated to instruction about the skills in question partly through the handbook, partly through the taped instructional and model lessons. The difference between the two is that in the instructional lesson, oral instructions mixed with short illustrated examples are given, while the model-lesson shows a continuous micro-teach-lesson which is taught by a model teacher. The handbook dedicates a chapter to each instructional sequence. In this chapter is included, in addition to the theoretical bakground to the skills in question, also instruction to and self-evaluation forms for both the micro-teach and the reteach lessons, on which the second and third days are spent in each sequence. The objectives for each instructional sequence and the skills covered are shown in the following.

I	Objective	To change teacher behavior in order to increase pupil readiness to respond to discussion questions.
	Skills covered	Pausing. How to treat incorrect answers in an accepting manner. Calling on both volunteers and nonvolunteers.
II	Objective	To improve teacher skills so as to decrease the amount of teacher participation and increase the amount of pupil participation.

	Skills covered	Redirection Framing questions that call for longer pupil responses Framing questions that require the pupil to use higher cognitive processes
III	Objective	To increase teacher use of probing techniques in order to guide the pupils to more complete and thoughtful responses
	Skills covered	Prompting Seeking further clarification and pupil insight Refocusing
IV	Objective	To reduce teacher-behavior that interferes with the flow of the discussion
	Rules to observe	Don't repeat own questions! Don't repeat pupil answers! Don't answer own questions!

It can be said in passing, that several of the skills have been rather freely translated into Swedish in order that their implication might be made somewhat more evident by the name itself.

3.4 Revision of handbook and programme scripts

On the basis of literal translations certain revisions were made in the minicourse material. So as not to make comparisons impossible, partly between the different national tests, partly with the original test, too radical changes were avoided. For each departure from the original material careful consideration had to be given to the necessity of revising.

Such a departure was the decision to omit all literature references in the Swedish handbook. In the theoretical background which is given in the original version of the handbook, repeated references are made to American research reports. It would presumably be of lesser interest for Swedish student teachers to have references to these, which in many respects are difficult to come by. In the Swedish version these references have

therefore been omitted. Accounts of the research results are, however, still in the new version and literature references have been substituted by general references to Borg et al (1970), where all the information exists for those who are especially interested in it.

As far the handbook is concerned still another important revision has been made. The text in the original version was considered to contain discussions of theories of learning to a too large extent. A certain theoretical anchorage in the skills which are presented is, of course, necessary and desirable. In this case, however, it was considered that the presentation in the handbook was too difficult to get at with its great number of terms and concepts particular to the psychology of learning. These were hardly relevant or necessary for the reader in order to have the intended exchange from the minicourse. The principle objective of the theoretical background must be considered to be to increase the understanding of the current skills and to increase the motivation to learn and to train these skills. The profound presentation in the original handbook in this respect could probably even work against such an objective. It should, however, be underlined that what has been done is a revision of certain theoretical sections, a popularisation, if you will, and that we in making revisions have been very careful to retain the basic thoughts behind each skill.

Lastly, it can be said that the handbook has otherwise been exposed to small modifications of a more semantic type. The Swedish handbook is, compared to the American, somewhat less familiar in tone, and the minicourse is not as strongly emphasized at the expense of other elements in preservice or inservice teacher training.

As for the scripts to the instructional and model lessons the Swedish presentation is, obviously, dependent on the contents in the handbook. It became apparent, however, that those modifications which had been made did not influence the contents of the programme to any great extent. In the case of the instructional lessons, which, as has been mentioned, consists of comments mixed with illustrated classroom examples, the comments have

been maintained as they were in the original version. In this way, the recommendations which were given in the investigation plan have been followed. On the other hand, it was necessary to completely revise the classroom examples. Partly, it must be kept in mind that the minicourse was intended for use both in junior and middle levels of the Swedish compulsory school, and at the pupils who participated in the different examples should be taken from all the current school grades. Partly, the contents of these illustrated examples had to be relevant to the teaching which was normally carried out on these levels. These changes were naturally foreseen in the investigation plan. The guideline which was given there was that the number of examples should be the same in the Swedish version and that the contents should, if possible, be taken from the same subject area.

What has been said above about the examples of the instructional lessons, also holds true for the model lessons. Therefore, these programmes had to be completely revised.

3.5 Programme production

The most urgent question before the production of the different minicourse programmes was which teachers should be engaged for the different classroom examples. "Each country should select flexible teachers with whom trainees will identify positively." This is the recommendation of the investigation plan and the Swedish project has in general tried to follow it. One problem was, however, if teachers or student teachers should be chosen as models, especially in regard to their function as identification objects. It was decided, however, that inservice teachers should be used because of their wider experience of and self-confidence in the teaching situation. This decision did not appear to jeopardize the demand for positive identification with the model.

It became apparent that it was possible to employ teachers who were connected with the experimental and demonstration school at the Gothenburg School of Education. Five such teachers

volunteered for the project. These five teachers taught grades 1, 3, 4, 5 and 6. At the first meeting with the group of teachers, they were informed about the minicourse and about the planned programme production. The preliminary version of the handbook was discussed, and the participating teachers had the opportunity to view the original programmes. Their immediate task was then to get to the bottom of those skills which they were to demonstrate. All the programmes were to be recorded on video-tape and all the classroom examples and model lessons should be in the form of micro-teaching. In order to accustom themselves and the pupils to this situation, and in order to be better able to check if the skills were being used in the right way, each participating teacher was allowed to borrow portable TV equipment to be used at his or her school. With the help of this equipment, consisting of TV camera, video-tape recorder and TV-set, he or she could in an effective manner prepare the final tapes.

From the very beginning it was obvious that only a part of the final tapes would ever be used. The reason for this was that, in the case of the instructional lessons it was necessary to produce a number of short classroom examples of skills. These examples had to be taken from a longer continuous classroom discussion in order that they might not appear too unnatural. Learned dialogue was to be avoided, and the pupils were in this way unaware of which questions the teacher would ask during the taping.

A great number of tapes were made then by the different teachers with different groups of pupils and varying subject areas. The recording of the model lessons were left till last, so that it would be possible to gain maximal benefit of the training, which the earlier recordings had given both teachers and pupils.

It was apparent that the recordings took both a lot of time and a large amount of work and it was only due to great exertion on the part of the participating teachers and classes, that the work could be finished with no great departures from the original schedule.

Parallel with the recording of the classroom examples, work was carried out with recording of the comments which went into the instructional lessons. As has been mentioned earlier, there was no reason to make any changes in the commenting text when the original version was translated. According to the recommendation in the investigation plan it was decided that there should also be a narrator in the Swedish programmes and it should therefore not be substituted with written comments.

When the recordings had been finished in some parts, rather demanding editing work began. In order to gain the necessary perspective to the taped material, it was necessary to transcribe the dialogue of all the recordings. With these written copies as a basis, the choice of examples could be made. At the Gothenburg School of Education there were not sufficient resources for doing the technical editing, and, therefore, all such work had to be done externally. This was a demanding procedure with respect to both personel and costs, and it caused the programme production to be greatly delayed. It also became obvious that no programme revison before the main field study was conceivable, and that those programmes which at this stage received their final shape, should be used in the main field-test. There were, therefore, insufficient personel resources and financial resources to make changes in the recorded material on the basis of what would eventually arise as to critical views during the planned pilot study. How this matter came to influence planning and carrying out of the pilot study and the main field test is accounted for in Chapter 5 and 6.

4 DESCRIPTION OF THE TECHNICAL EQUIPMENT

One of the fundamental elements of micro-teaching, and of the minicourse, is the audiovisual and rapid feedback which the videotechnique offers. In order for the student teacher to be able to derive optimal advantage from the technical possibilities and not to get lost in technical problems, great demands are placed on the technical equipment. Besides being highly reliable in running, the equipment must be such that it can be operated by a person without great technical knowledge. The first equipment which came onto the market for use in schools was clumsy and hard to operate, in addition to which it demanded a great deal of technical knowledge and operating ability. The development of the videotape equipment has quickly moved towards smaller and more easily manoeuvrable units.

4.1 Criteria for suitable videotape equipment

Which demands can then be made on a functional TV-equipment? The demands for the present minicourse are to a great extent the same as for the MT project at the Gothenburg School of Education (Brusling-Tingsell 1973). It is this similarity in technical demands, that has made it possible for the minicourse project to adapt the equipment directly from the recently completed MT project.

The demands on the video equipment can be summarized in the following way:

It should

- be operationally very quick and easy to use even for the technically inexperienced
- demand a minimum of help and instruction from the coordinator
- be durable and have low servicing demands
- be lightweight (easy to carry between different schools and between different rooms)

- have a small format (not demand too much space in the classroom)
- have good possibilities for quick servicing in the place where it is being used
- make good use of the videotapes
- be inexpensive
- be flexible and useable in many different areas of education
- offer the possibilities of copying programmes to the equipment

The equipment which was used for the minicourse is a video-cassette system and was delivered by Svenska Philips AB. For a more detailed description of the components which go into the equipment see Appendix A.

Below follows a summary of how the equipment functioned in relation to the above criteria.

Criterion	Agreement with Criterion	Comment
easy to use	very good	student teachers all agree that the equipment was easy to use
durable	very good	especially in regard to the fact that it was exposed to some hard treatment during both the course itself and during the analysis of pre- and post tests
weight	under par	about 110 lbs (50 kg) during transport of three units
format	good	it is positive that the same tape-recorder is used for both recording and playback
servicing	very good	at least in Gothenburg
tape-economy	average	-
price	good	about 10.000 Swedish Crowns
flexibility	very good	compatible with other European casette machines
copying-possibilities	good	however, please se comment below

4.2 General comments

Even if ITV-market offers lighter equipment than that which was used in the minicourse project, we think that it has specific advantages which more than well motivate buying it.

A warning should, however, still be given. In the beginning there were great problems to get the TV-receivers to show the copied programmes without shaking and rolling. The TV- receivers with a more simple construction seem to have difficulty accepting the synchronising signals of the tape-machine. A careful investigation and test of the different units' ability to "cooperate" must be made before choosing the type of receiver. This is especially important when showing copied programmes.

Sound recording offers difficulties, especially in a classroom with bad acoustics. The placement of the microphone, which was used both during the pre- and post-recordings and during the student teachers' microteaching sessions, was from the ceiling (from a lamp or such) at a central point in the classroom (fig 4:1, 4:2) This placement has shown itself to be the most suitable and technically least complicated. It has given a sound quality which, despite its shortcomings, can be considered to meet the primary demands of the course as to analysable teacher and pupil talk. It must be considered as a definite advantage to be spared the complications which a sound mixer gives rise to.

The apparatus has during the work on the project been exposed to relatively large trials, through the continual moving between different schools and premises. Those persons who have used it have for the most part been unfamiliar with videotape-recorders. During the analytical phase of the project, the strains on the apparatus have in no way been lesser. The analytical work has demanded that it be stopped and started, reversed and started without cease. For each recording this procedure has been repeated up to a hundred times for each analysed skill. Only very small symptoms of wear have, in spite of this, been noted.

The need for servicing has been limited and the servicing which has been demanded has been carried out in Gothenburg by AB

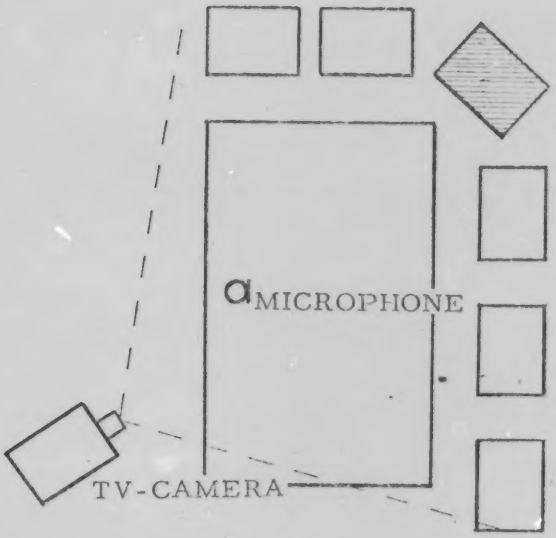


Fig 4:1. Placement of the TV equipment in the microteaching clinic

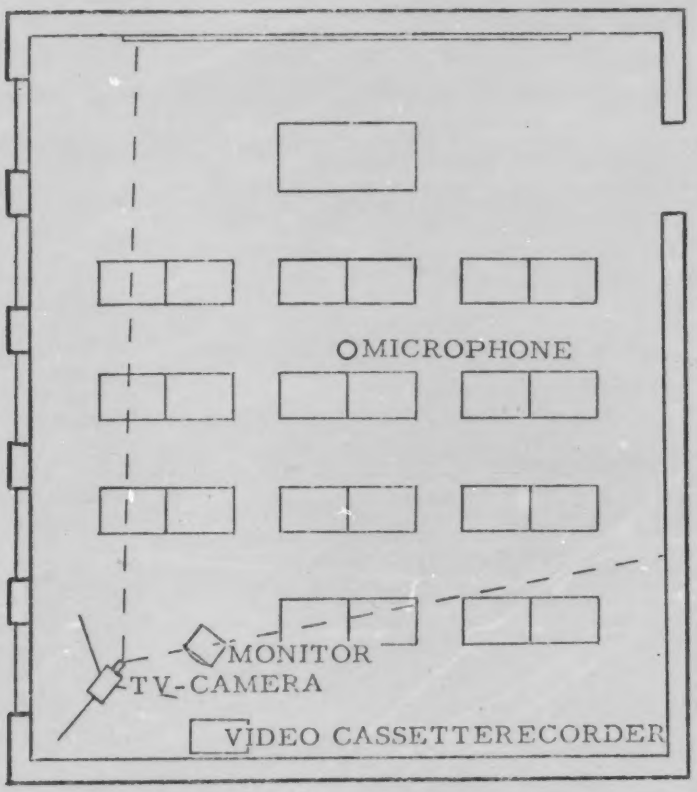


Fig 4:2. Placement of the TV equipment during pre- and post-recording

Servex, which has functioned well. At this point we can not say how servicing functions outside of the larger cities.

4.3 Attitudes towards the technical equipment

The general judgement of the video equipment is that it has been very easy to use. "Technically, everything functioned well" is a continual comment from the journals of the student teachers. Many student teachers expressed concern before the beginning of the course, that they would not be able to operate TV-equipment, but all of them expressed their satisfaction at the end of the course and said that the equipment was easy to handle. Everyone has even considered the coordinators' instructions as sufficient (Chapter 9.4). The student teachers have had access to an easy-to-understand, self-instructing technical manual, which came with the equipment. By going through this manual point by point lesser faults and faulty manoeuvres could be corrected. See Appendix B.

4.4 Production of the instructional and model lessons

The difficulties with the work of editing have already been touched upon (Chapter 3). In order to get enough examples for demonstration of all the different skills, material of several hours length has been recorded. From this material the desired parts - as well as the separate recorded comments - were now put together into a whole. In addition, the text was copied onto the pictures afterwards. This places very great demands on the technical editing equipment. Sufficiently advanced equipment did not exist at the ITV department of the Gothenburg School of Education and the editorial work had to be done by a commercial firm, which turned out to be rather expensive.

Very careful work had to be placed on the technical part of both the editorial work and the copying to the video-cassettes. The cassette copies had to contain a technically acceptable signal in order that the result during playback should be satisfactory.

In order to assure signal quality a processing amplifier was rented for the editorial and copying work.

5 PILOT STUDY

As was mentioned earlier (Chapter 3) the programme production greatly exceeded the time boundary that had been set up. Therefore, it was not completely carried out until after the middle of May 1973. Because the whole of the autumn term 1973 had to be dedicated to the main field test, there were then only a few weeks left for the pilot study. This study had to be carried out before the end of the Spring term because none of the subjects, either teachers or pupils, would be available during the Summer holidays. This, in its turn meant that the question of a complete pilot test of the minicourse was quite impossible. It would take 15 working-days to go through the minicourse, that is to say, about three weeks. This upset the plans, of course, but it was still not seen as a hinder to the carrying out of the main field test. In the investigation plan the foremost aim of the pilot test was stated as "to give the participants the opportunity to run the course, enabling them to obtain experience in setting up the micro-teaching situation ..." Because there already existed at the department stable knowledge of and experience from the micro-teaching (compare page 11), it was thought that the pilot test could be limited to a rather more surveyable scrutiny of the material. This examination would then be combined so that the subjects would go through some of the instructional sequences, this is to say complete a micro-teaching cycle (with instruction, micro-teaching and the revised micro-teaching according to fig 3:1 page 9). In this way one could also get information about how the self-evaluation forms would work.

It was decided then that we should try to get some student teachers to cooperate as subjects. A query then went out to the student teachers i L5 and M6, this is to say persons who were just about to begin their careers as primary and lower secondary-schoolteachers. Although this query reached the sendees during the last days of their final terms, some of the student teachers in M6 agreed to take part. These student teachers began their

work by reading the teacher handbook. After that they saw the minicourse programmes and discussed together the handbook and the programme following each instructional sequence. In a questionnaire they also gave account of their impressions of the minicourse's informational parts, that is, the handbook and the programmes. After that each chose an instrucional sequence for further study and went through it according to the instructions in the daily course sequence. TV-equipment was made available to them in the school which they themselves . shose as suitable. Those demands that they placed on the school were that they should have classes which they earlier in their education had had contact with and that the pupils from these classes should be those whom the student teachers knew somewhat well. They chose the subject area for the training period in cooperation with the class-teacher. One pre-requisite for the skills in the minicourse to be applicable, is just that the material which is to be discussed, is something the pupils already know about.

The recording of the microteaching sessions was run by the student teachers themselves after some instruction in the operation of the apparatus. This instruction was given by a special coordinator, who in this way derived valuable experience which could be used in the main field test to come.

Because the preliminary testing of the course - for reasons already explained - could not be carried out as planned, it was, of course, difficult to draw any really general conclusions from the results. The participating student teachers' opinions gave rise to some lesser changes in the handbook. The subjects did not report any difficulties in working with the instructions or with the self-evaluation forms which were in the material. They demonstrated also a clearly positive attityd to the minicourse, even if their contact with parts of it left something to be desired.

What has been accounted for here is then only the subjective impressions from a very few subjects, and it can therefore not pretend to be results derived with a scientific method. But because the aim of the pilot study first and foremost has been to

give an opportunity to see the material as it functions and to make it possible to arrange micro-teaching situations, it was considered that the results of the pilot study were at any rate relatively satisfactory. The possibilities of deriving further information on the material during the main field test before a later revision, were also thought to be good.

6 PLANNING OF THE MAIN FIELD TEST

The change in the time table, which has been mentioned earlier, also influenced the planning of the main field study. A certain part of the planning had to go on parallel with the pilot study. This meant, in its turn, that the information which could be given to presumtive subjects, in some ways had to be based upon knowledge of how the American material functioned. Modifying the investigation plan in this way apparently did not imply any negative consequences. In the following, we shall render account of the design of the main field test.

6.1 Considerations about the choice of subjects

It was decided in the very beginning of the project, that the Swedish test- group should consist of student teachers. As has been mentioned earlier, one of the objectives of the Swedish experiment was to develop a teaching aid intended for use in preservice teacher training. Those deliberations which had to be made before the final choice of subjects involved mainly three questions: 1) During what period of the teacher training should the study take place? 2) What category of student teachers should be considered? 3) What kind of selection should be adopted?

In the case of the first question - during what period of the teacher education the minicourse should be tested - it was demonstrated at an early stage, that practical considerations would be decisive. One pre-requisite for the execution of the course was that the participants in the course should have access to pupils for the microteaching sessions, pupils who, preferably, should not be completely unfamiliar to the teacher student. This in its turn gave rise to the problem of placing the minicourse in some period during the education of the student teacher, when he or she would be spending some time with one single class. A three-week practice period was a definite minimum demand, but in view of all the other activities which would be competing

with the minicourse for the student teachers' interest, a much longer period was necessary. The only practice-period which was sufficiently long appeared to be the practice-term, which comes last (for student teachers in academic subjects) as well as the next to last term (for student teachers at junior and middle levels) during the education.

The other question, - what category of student teachers should be considered - has already been touched upon. (Chapter 3). In the Swedish investigation plan both student teachers at junior and middle levels and student teachers in academic subjects were considered as test-groups. However, the latter had to be ruled out at the very onset. The reasons for this decision were many. It was obvious that the possibilities of selection would be limited, due to the fact that only student teachers in academic subjects at the senior level of the 9-year compulsory school could be considered. Otherwise, the age-discrepancy of the participating pupils would be too great as compared to those age-groups for which the original material was produced. It became obvious that only student teachers with certain combinations of subjects could be considered, and these subjects had to be those which were suitable for discussion teaching. This factor reduced the selection-group even more. Furthermore, there were in the group of student teachers in academic subjects no naturally suitable substitute teachers (See Chapter 3, page 12), because each student teacher during his or her practice term is independently responsible for teaching of his own classes. Finally, the particiaption of this category of student teachers would have meant that the instructional and model lessons had to be varied even more, in consideration of the model teachers and model pupils. We do not, however, want to abandon the thought of giving these student teachers the possibility of training the minicourse skills. Conceivably, the next step in activity around the minicourse would then be to adapt the American minicourse 3: Effective questioning; secondary level, which covers the same skills as minicourse 1, but is suited for teachers on the senior level. Therefore, subjects should be taken from among the student teachers at junior and

middle levels. For economic and practical reasons, a random selection was inconceivable. It was also considered essential that the execution of the course should be on a voluntary basis. In order to entice the student teachers to cooperate in the mini-course study, it was decided, in cooperation with the director of studies at the pedagogical department, that participants in the course would be allowed to count their participation as an alternative to the obligatory field-work in pedagogics, which each student teacher generally carries out during his practice-term. The stipulations were in this case the same for all the student teachers. Written information was sent out to both groups and the student teachers at the middle level also received the possibility of oral follow-up. Because of an oversight, the student teachers at the junior level did not receive this opportunity. The former showed great interest in participating in the project and 43 student teachers - about half of those attending the course during that term - applied, despite the fact that they were informed, that only a limited number would be considered, due to financial reasons. In the latter group attendance was slight, possibly due to the oversight mentioned above.

Finally, the third question - which type of selection should be adopted - was to the greater part, then, a practical question. As has been mentioned before, random selection was ruled out because of reasons of economy. Such a selection was, in addition, incompatible with the principle of volunteering. In order to carry out the study with the amount of technical equipment, which was available (five units) it was necessary for at least two individuals to be at the same school and to be able to use the same unit of equipment. According to the plan of investigation, the study would then be spread to fifteen schools. The planned number of subjects was set at thirty. In selecting these individuals one had to respect the fact that the distribution of student teachers at junior and middle level should be kept somewhat even. This last desideratum was, we soon found out, difficult to satisfy due to the fact that so few trainees at junior level had shown interest in participating. It was therefore decided that intensified attempts should

be made to recruit more student teachers of this category. This recruitment would be made at the very beginning of the autumn term through personal contacts with thinkable individuals. This would not imply any change in the schedule, because the study would take place in three turns, and the first individuals in the first turn could be taken from among the student teachers at middle level who had applied.

6.2 Control group. Reasons for decisions around the control group

In the original plan for the Swedish study, as well as in the American minicourse study besides, there was only one experiment group. The set-up which was sketched out in this plan was that of a simple one group experiment, with recordings of the subjects' classroom behaviour before and after having taken part in the course. In the American design, a control group had originally been planned in addition to the experiment group. This plan had to be abandonned because of difficulties in finding a comparable control group. Borg (1970) describes that as a short-coming in testing, but he thinks at the same time that the need for a control group is rather small in tests of the type which were carried out at Far West Laboratory. As a test group in-service teachers with an average of 9 years of experience were used. It can be assumed that teachers of this type more than likely have developed a rather stable teaching-pattern and would hardly change this pattern unless they were submitted to some form of direct systematic influence. Such an assumption is made in reference to investigations (among others Bellack et al, 1966) who report an obvious stability in teacher behaviour from one lesson to another.

In the Swedish study, however, the situation was somewhat different. Instead of inservice teachers, student teachers were used in the test group. Of course, these student teachers did have three (L) and four (M) terms of study, but in consideration of the relatively limited element of practical experience during these terms, it was possible to draw the conclusion, that their

teaching experience was rather small. Moreover, they had not yet had time to put into practical use that knowledge which they had gained in methods courses. In other words, they had had rather limited possibilities of developing any specific or stable teaching-pattern. It could then be expected of them, that during their practice term - when they were independently responsible for the greater part of the classroom teaching - that they would change their teaching-behaviour a great deal. That should be the logical consequence of their greater experience and self-confidence in the teachingsituation itself, as well as to the fact that they could receive more intensive supervising. Borg (1970) has also made the same assumptions, but as a result of a mini-course study on student teachers with both experiment and control group he reports that the latter group changed comparatively little during a two month interval.

Despite the fact that nothing argued in favour of the necessity for a control group, it was still decided that the Swedish main field test would include both experiment and control groups. If it was shown that the hypothesis which was presented (see Chapter 6.3) - i.e. that the experiment group employed the skills of the minicourse to a greater extent at the post test, we wished to be able to assert, on the basis of the results attained from the control group, that the behaviourial alteration was a consequence of the minicourse and not the results of other influencing factors during the practice-term.

6.3 Design

During the planning of the Swedish study the design was to a great extent already set down in the investigation plan which was sketched out by Far West Laboratory. It was recommended that all the national projects follow this plan, partly, in order to make possible comparisons, partly, in order that parallels could be drawn with the American study. As was mentioned in the preceding section, however, this simpler design was not considered satisfactory enough to illuminate those questions which were peculiar to the

Swedish project. A somewhat modified design was therefore adopted.

6.3.1 Hypotheses. One of the main goals of the Swedish testing (compare Chapter 2) was to study the learning effects of a minicourse in teacher education. The following hypotheses were presented:

a) The following teaching skills are adopted to a greater extent after completion of the minicourse.

1. pausing behaviour
2. to treat incorrect pupil response in an accepting manner
3. calling on both volunteers and non-volunteers
4. redirection
5. framing questions that call for longer pupil responses
6. asking higher cognitive questions
7. prompting
8. seeking further clarification
9. refocusing
10. avoiding the repetition of own questions
11. avoiding the answering of own questions
12. avoiding the repetition of pupil answers

b) There is on the whole no difference between pre- and post-recording results for the control group.

c) There is on the whole no difference between student teachers at different levels in command of the skills of the minicourse.

Hypotheses under a) are common for all the national transfer projects and agree with those hypotheses set up for the American original study. Hypotheses b) and c) are probably specific for the Swedish project; this is, at any rate surely the case in hypothesis c).

In section 6.2, account is rendered of the considerations, which led to the decision on the control group, and of those which are the basis for hypothesis b). As far as hypothesis c) is concerned, its background is the fact that the area of use has

been extended in the Swedish version so that it also includes the junior level of the compulsory school. Therefore, there might be reason to study if the learning effects of the minicourse are the same irregardless of which level the teaching takes place.

6.3.2 Procedure. The following factors were therefore object of study in the testing of the minicourse.

Condition	Minicourse			Non-minicourse	
Level	junior	middle		middle	
Sex	female	male	female	male	female

The design would be based on a comparison between an evaluation before and after the minicourse of the skills in question. This evaluation would in its turn be based on systematical observations of 15 minutes long lesson sequences, which were recorded on videotape for later analysis. In addition to these comparisons between the pre- and post recordings of the experiment group, a similar analysis would be made concerning the control group. Moreover possible difference between levels would be tested. The sexfactor was omitted as an experimental factor, since there was nothing which could support a hypothesis on possible differences between the sexes in this particular case. On the other hand sex was included, as was the grade of the pupils, for identification data.

6.4 Subjects

In all, 42 student teachers were engaged for the main field test. 32 student teachers were assigned to the experiment group and the other 10, to the control group. The distribution of female and male student teachers on level and trial condition is shown on the table below.

Table 6:1. Distribution of subjects on trial condition level and sex

		Exp group		Control group		Total pop	
Middle level	Male		(0.19)	2	(0.20)	27	(0.18)
	Female	14	(0.44)	8	(0.80)	81	(0.53)
Junior level	Male	-		-		1	(0.01)
	Female	12	(0.38)			44	(0.29)
		32		10		153	

The figures within the parentheses indicate relative distribution

The table shows that no junior level student teachers were included in the controlgroup. Since the purpose of the control group was mainly to investigate if the practice situation itself possibly implied the behavioral alterations in the same direction as were desired in the minicourse, it was assumed less essential that both levels be represented in the control group. There is no sensible reason to assume that junior level student teachers are influenced to a greater extent or in some other way than middle level student teachers. The distribution of male and female student teachers does not deviate, as it is shown, in any drastic manner from the distribution in the t otal term course. It is obvious from the selection that the question of representativity was not of primary importance during the study. It is more interesting to see how the student teachers are distributed in different grades. Because we wanted to investigate what effect the minicourse had on both junior and middle levels of the compulsory school, it was essential that all grades on the different levels be represented. The distribution is shown on Table 6:2.

Table 6:2. Distribution of subjects on grades

Grade 1	4
Grade 2	4
Grade 3	4
Grade 4	8
Grade 5	10
Grade 6	2

As is shown the fifth grade is somewhat overrepresented and the sixth grade is, on the other hand, under-represented, but the differences are not of such size as to warrant suspicion of a systematical influence on the results. One thing that the project-group looked forward to with some excitement was how the first grade would make out in this connection. Since the study would take place during the autumn term and the minicourse turn for the junior level student teachers lay in the middle of the term, this meant that the pupils in the first grade would have had only about 1 month of school behind them, when the minicourse started. As is shown by the account of the results those apprehensions of special difficulties with teaching for the student teacher, turned out to be, to a certain extent, well-founded, not because the student teachers in the first grade less than others showed behavioral alterations in the desired direction, but because the course itself was experienced as being more difficult to carry out with such young pupils.

6.5 Schedule for the main field test

For practical reasons, the minicourse study had to be carried out in three turns. Ten student teachers could follow through the course during each such period. Figure 6:1 shows how the term activity was planned.

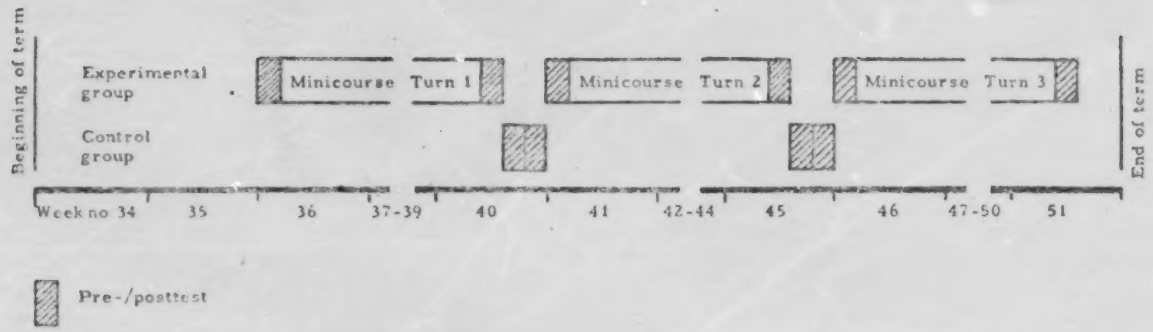


Fig 6:1. Time schedule for main field test

As is shown, the post-recordings of the last period were not carried out until the last week of the autumn term. The extra work strain which this meant for the student teacher had to be weighed against the disadvantage it would have involved, if the course had started during the very first week (week 34). It was considered extremely important that the student teachers have time to adapt themselves to their new situation in the practice term. In most cases they met completely new classes, a new supervisor and an unfamiliar school. Many had even had to move from one abode to another. In addition to the fact that the project members thought it psychologically unsuitable to add another element, that is, the minicourse, to what was already unfamiliar, it was considered important for the carrying out of the test itself that the student teacher had had time to establish some contact with his/her pupils. The field phase of the main study, began then during week 36, two weeks after the beginning of term.

6.6 The coordinator's tasks

For the sake of the study it was considered of great importance that the minicourse be administrated in such a way that the participants work-investment could be placed on the course itself.

Special coordinators were to be responsible for this administration. In the American investigation plan, it is suggested that one coordinator be assigned to 15 participants in the course, under the conditions that they were not spread out over more than three schools.

This recommendation proved impossible to follow in the Swedish study. This was due, partly to the fact that, with one exception, there were no more than two student teachers at each school. Then again the geographical spread of the practice schools was such that a coordinator could not have contact with more than two schools at a time. The map below shows how the practice schools in question were placed in relationship to the Gothenburg School of Education. The average distance to the schools was 94 km and the greatest, 205 km; the shortest distance was 8 km.

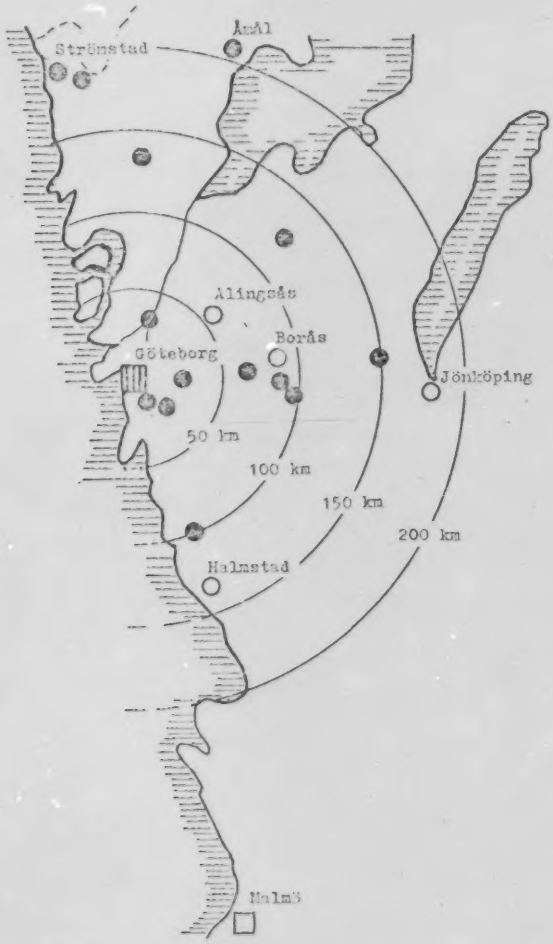


Fig 6:2. Map showing location of practice schools during main field test

Coordinators' duties were the following:

- to plan the activity of the minicourse as it went along.
- to make pre- and post-recordings of a discussion lesson with the entire class and the respective participants in the course.
- to give instruction in the use of the technical equipment.
- to make a presentation of the study material (handbook and TV-programmes)
- to maintain a continuous contact with the student teacher in order to solve problems of a technical or pedagogical nature.
- to follow the student teachers continuously in their work with the minicourse so that no serious delays would arise.
- to acquire views on the minicourse material and the technical equipment both during and after the course.
- to take care of the transport of the technical equipment to the different schools.

As is shown in the above list the main part of the coordinators' duties consisted in keeping contact with each of the participants in the course. This continuous contact was kept partly through personal visits on some occasions during the time the course was carried out, partly through telephone contact two or three times a week. On the occasion of the visits a routine check of the technical apparatus was made. Three coordinators were connected to the project. Each participant in the course had one and the same coordinator during the entire period.

7 THE MAIN FIELD TEST

The field phase of the minicourse study was carried out during the autumn term of 1973. As has been mentioned earlier it had to be divided into three periods. This implied a departure from the recommended plan and this depended first and foremost on the fact that only two student teachers could use the equipment at the same time. It was then possible to allow ten student teachers during each period to use the equipment, as there were five sets of equipment available. All together 32 student teachers were included in the test group. Of these 12 were student teachers at the junior level and 20 were at the middle level. In the preceding chapter account was rendered of the distribution of student teachers according to grades.

The student teachers, who were accepted for participating in the test group, were informed by letter as to during which of the periods their work would begin. They then were informed as to which of the project's three coordinators would be available to them. After this beginning information all contact between the project group and the student teachers went via the coordinators. The control group's student teachers and their supervisors received written information about the times for the pre- and post- recordings.

7.1 The pre-recordings

In conjunction with the beginning of the course a recording of a classroom discussion was made with each of the participants in the course. Recording of the student teachers in the control group was made some time before the start of the second of the three minicourse turns.

Both the student teachers and the supervisors had been informed by letter of the recording and the purpose of it. Afterwards each of the coordinators agreed with the persons concerned on a more

exact time and then made the recording himself. The instruction which was given was somewhat unspecified. The only direction the student teacher received was, that he or she should have a 20 minutes long discussion lesson with the entire class. It was also pointed out that the discussion should concern something which the pupils already knew well. In this way, it was hoped that the recording situation would as much as possible simulate normal discussion teaching. The choice of subject for these classroom discussions appeared very similar for the different student teachers. They were mainly general conversation topics such a mobbing, pollution or rules of conduct. It was only by exception that topics, which demanded specific knowledge were chosen. Pre-recordings with the student teachers in the control group were carried out in the same way and after the same instructions as in the experiment group. No differences as far as choice of subject could be noted from one group to the other.

7.2 The conducting of the minicourse

In order to prohibit the influence of factors which could make it more difficult to conduct the minicourse for the student teacher, everyone with any connection with the activity of the project was informed directly by the project group. In this way, the principals at the respective practice schools were informed of the study and of what the practical pre-requisites for it were. The supervisors, who would be more directly drawn into the activity, were informed partly by letter, partly through personal contact with the respective coordinators. It was important for the sake of the project to assure ourselves of support from the supervisors, partly since they would be helpful both in acquiring the suitable premises and partly because they would function as substitute teachers on those occasions, when the student teachers were taking a small number of pupils from the class for their microteaching sessions. All the supervisors were especially helpful and did a great deal to facilitate the execution of the study. Another category which could conceivably come into close contact

with the student teachers' work on the minicourse were the methods teachers who at different times visited the practice schools. The methods teachers were informed in writing, where it was especially emphasized as was done even in the letters to the supervisors, the importance of allowing the student teachers themselves to evaluate their recordings. The intention behind this was that the student teacher should feel free to seek new methods if no one else viewed his recorded efforts. For the student teachers work began, as has been mentioned, with the pre-recording. The coordinator then gave instructions as to the operation of the technical equipment and, in cooperation with the two student teachers and their supervisor, worked out a detailed time- and room-plan (most often group rooms etc), where the microteaching sessons should take place. The student teachers could then step by step follow the detailed daily course sequence which was included in the handbook. Since the course was auto-instructional, the duties of the coordinator were mainly restricted to administrative and technical problems.

In order that the project might get as much information as possible about the different components of the course, the student teachers were given the assignment of keeping a diary during the length of the course. An example of this diary had been worked out by the project group and contained, in addition to a description of the activities from day to day, also a form for opinions which concerned the instructive parts of the minicourse. The purpose of the diary was partly to find a basis for a possible revision of the minicourse material later on. It was also seen as a basis for an account of the field work the student teachers would be doing after the completion of the practice term. Participation in the minicourse project was counted (compare page 31) as an alternative to an obligatory field work assignment in pedagogics. The diary could also be seen as a valuable document, if in future it should turn out to be desirable to have a list of suggestions for suitable discussion topics for microteaching sessions as an appendix to the rest of the minicourse material. Statements made by some of the participants in the course intimated that this could be the case.

Upon composing the descriptive parts of the diaries, it was made obvious that the topics of discussion which were chosen for microteaching fell into three principle categories. The most usual conversation was around the topics which were treated in social studies for example, domesticated animals, the stone age, the water cycle, the forest, the holy scriptures etc. After that followed discussions about some book the class had read, for example, The Diary of Anne Frank, Bilbo, They Call me Fatso. Even topics which were rather free, of the type school comfort, respect and tolerance, pollution and such, were common. Based upon the comments from the student teachers it is obvious that there were no difficulties in chosing topics on the middle level of the compulsory school, while there did appear to be certain problems, on the junior level, especially in the lower grades.

7.3 The post-recordings

Directly after the end of the course but before the technical equipment was moved, the post-recording was done. The instruction for the carrying out of this, was the same as for the pre-recording. As far as the control group is concerned, their post-recordings were done after about four weeks, that is to say about the same length of time as the minicourse took the experimental group. Because the student teachers in the control group had been recruited from among those who wanted but were not able (because of practical reasons) to take part in the course itself, they were offered the chance of seeing their own taped lesson after the end of the post-recordings and could have them analysed with the help of Flanders' interaction analysis. The offer was seen as compensation for the encroachment in their teaching which the two recordings had made. This also made it possible to get a sufficient number of teacher students into the control group.

As for the choice of subject matter in the post-recordings a certain difference was noted in the case of the experiment group. The general topics were to a great extent cast aside and the dis-

cussions more often touched upon material on a higher cognitive level. This was, of course, not unexpected because the contents of the minicourse's model lessons had often been of the same type. No such change, however, was noticed in the case of the recordings made by the control group.

7.4 Questionnaire to the student teachers

In an inquiry made at the end of the minicourse the participating student teachers were asked to give summarical opinions about the course; this inquiry was in other words, an extended course evaluation.

Of course, the diary contained many different views about the different parts of the course, but for the simple reason that it was a diary, it did not give any complete picture of how the course was taken. In making the inquiry, we wanted to find out how the student teachers looked upon certain problems of vital interest in the continued use of the course within teacher education. In this way, by the same time, we wanted to get some idea as to (1) the extent to which the course really had been auto-instructional, (2) which grades it was most suitable for, (3) during what phase of teacher education it would best be taken, (4) if the self-evaluation forms were felt to be sufficiently exhaustive, etc. The answers to the query will be accounted for in Chapter 9 and the questionnaire is presented in its entirety in Appendix C.

8 EVALUATION OF THE PRE- AND POST-RECORDINGS

In order to make systematic observation of a teaching process with as accurate results as possible, the observer must unconditionally be perfectly familiar with those behaviours which are to be observed and registered. The aim of the training of observers is to get each one to see the same thing and to introduce as few of his own evaluations as possible. In order to attain this goal, two demands must be made. The first is, that the categories with the help of which the teaching process is to be described, must be carefully defined in behaviourial terms. The other is that those behavioural patterns are described for the observers in a series of concrete situations. In order to meet these demands the following measures were taken for the sake of the minicourse study.

The four observers who were connected to the project took part in the work of defining the categories of the observation. This was seen as a good means of reaching agreement among the observers. (Lippitt et al 1954). In order to give the observers as good knowledge as possible about the course and its objectives, they were allowed to go through the instructional parts of the minicourse. There was, however, no possibility for them to go through any microteaching cycle (Compare figure 3:1). As a basis for the discussions which led to the definitions of the different categories, an evaluation manual was used from Far West Laboratory (Borg --), as well as an account for the construction and results of the American study. (Borg et al 1970). In order to give a concrete demonstration of the observation categories, principally the minicourse programmes were used. The main training took place, however, in taped, usual classroom situations where teacher and student behaviour lacked the strictness they had in the instructional programmes. In this way they were more similar to the material which was going to be analysed. These training situations had been taped earlier for another purpose than the minicourse, but they had similar contents and had

been recorded under similar forms, among other things the instructions to the student teachers had been the same.

The form used for the observations was that which had been worked out for the study of the American version. These forms had been changed somewhat and are to be found in Appendix D The reason for using these forms, which were already worked out, has to do with an endeavor to follow as carefully as possible the definitions of the variables, which were originally laid down by the Far West Laboratory. This was desirable from point of view of the transfer project. The list of variables is presented in Table 8:1.

Table 8:1. List of variables for the minicourse project

Independent variables	Pre- and post-recording
	level (junior or middle)
	experimental/control group
	grade
Dependent variables	Total number of questions from teacher
	number of questions without pause
	Total sum of the length of the pauses in seconds
	Average length of teacher pause in seconds
	Total number of pupil responses
	Average number of words per pupil responses
	Number of one-word pupil response
	Non-punitive reaction to incorrect pupil response
	Punitive reaction to incorrect pupil response
	Redirection
	Number of fact questions
	Number of higher cognitive questions
	Proportion of fact questions
	Prompting
	Asking for further clarification
	Refocusing

Table 8:1

Teacher repeats own questions
Teacher answers own questions
Teacher repeats pupil-answers
Proportion of teacher talk

Four observers were connected to the project. They worked in pairs, where each pair worked with its own observation form and with one skill at a time. This work-model served two purposes. First, opportunity was given to estimate the interobserver agreement and at the same time maintain a control of the reliability of the observations. Secondly, it was possible to limit the time for observation of each variable. The last point was essential because it was important to keep the reference-frame of the observers as unaltered as possible from the first to the last observation of each skill. In the long run, time could have been saved by allowing the observers to observe several variables at a time, but this would also have meant a threat to the demand for an unaltered reference-frame. Each pair of observers analysed together then the entire material for each skill. After each such perusal of the material the combination of observers was changed. In all, eight such run-throughs were made.

When the interobserver agreement was considered sufficient and stable, a control measure of four random recording samples from the minicourse was taken. The criterion for sufficient training was a product moment correlation of 0.90. If the criterion was not met, training was continued until the agreement reached a level of desired sufficiency. For each run-through of the analysis the training procedure was repeated with the skills in question.

8.1.1 Plan for observations. The video-cassettes, which were taped, were after the recording supplied with a random number combination. In this way the observers did not have any possibility of identifying the experiment or control group or the pre- or post-recording with the help of the markings on the cassettes.

The recordings were analysed according to a randomised viewing plan so that each observer analysed half of the material at each showing. Both of the observers in the pair went through the material together. In each run-through there were a number of recordings which were shown twice so that the evaluations of stability and interobserver agreements could be made. The viewing plan was worked out in such a way that the observers did not find out about which recordings were intended for control measuring. A new viewing plan was drawn up for each run-through of the analysis.

8.1.2 Practical arrangements. The observers were provided with a video tape-recorder each, a TV-set each and also each his own pair of ear-phones to make individual observations. The equipment was arranged around a large table in such a way that the observers could work to the greatest possible extent without being distracted. The observers did the analytical work itself completely independently of each other.

If there was any doubtfulness about the analysis, the two or even more in the project group confered on how the problem should be solved.

In order to avoid allowing the observers to become inattentive and in this way influence the analysis in a negative direction - the work was somewhat monotonous - work was interrupted by frequent pauses.

8.1.3 Directions in the analysis. The observation forms (Appendix D) and the list of variables (Table 8:1) gives information about the

variables which have been coded.

Within the definition of the variables a great amount of work has been laid down on attaining agreement with the principles and the spirit which the course supplies. As far as the codifying goes, we have been very restrictive. Only clear and conscious adaptations from the student teachers of the different skills have been coded. We can use redirection as an example of this. In this case, coding has taken place only if the subjects have actively used this technique in the discussion. A "let-go" course of events during the lesson, which at first sight could appear to be a redirection sequence has not been coded, because it only gives a talky and unstructured type of teaching. Furthermore, in accordance with the instructions to the course only such skills have been codified as encourage one single student to take active part in the discussion. Therefore, no coding has been done if the skill of prompting has been demonstrated but has been directed toward the entire class. For more complete detailed information about how the different variables have been defined in coding, see Appendix E.

8.2 Stability and inter observer agreement

Unknown to the observers, a number of recordings for each skill has recurred in the coded material. For control of stability an observer has coded the same tape both at the beginning and the end of the analysis occassion. For inter observer agreement, several recordings have been coded by two observers. These recordings have been distributed over the entire analysis period. The result of the calculations of intra observer agreement (stability) and inter observer agreement is accounted for in Table 8:2. As a measure of the agreement product moment correlation or rank correlation coefficients have been used.

Table 8:2. Agreement and stability measures for the analysed skills. Product moment correlation

Variable	Interobserver agreement	Stability (means)	Number of recordings for the calculation	Notes
pausing length	.99	.92	10	
words per pupil response	.97	.98	10	
punitive reaction	.90	.91	8	Spearmans correlation of ranks
non-punitive reaction	.88	.90	8	Spearmans correlation of ranks
redirection	.97	.97	10	
proportion of fact questions	.91	.82	10	
prompts	.58	---	7	Coeff of concordance
further clarification	.67	---	7	Coeff of concordance
refocusing	---	---	7	Coeff of concordance
negative behavior	.78	.87	10	
proportion teacher talk	.99	.99	10	

8.3 Revision and estimation methods

Those pre- and post-lessons which have been taped during Far West Laboratory's investigations have been about 20 minutes long. For financial reasons the Swedish project chose a 15 minutes long sequence of a discussion lesson. In this connection there is no reason to fear any distortion of the results due to this adjustment of the length of the observation period.

Sometimes, it has been difficult while recording in the field to make recording of exactly 15 minutes length. In some cases, this depended on the fact that the student teacher himself interrupted the lesson after about ten minutes. In all cases the taped lesson has been analysed, the time for the recording measured and the measured variables adjusted to 15 minutes lessons.

The dimension of those results of the Swedish investigation which are accounted for in the report are then: number, per 15 minutes lessons, or seconds per 15 minutes lesson.

Revision is done by data. In order to reach a direct comparability with the results at Far West the results accounted for, the experiment group and the control group have each in its turn been t-tested with BMDX70 (BMD 1970). Furthermore, covariance analysis (Cramer 1967) has been used to test the difference between the experiment and the control groups in regard to the initial differences between the groups and to test the differences between student teachers on the lower and upper levels of the primary school. For a statistical description of the bound questions in the student teachers' diaries BMDP2D (BMD 1971) have been used. In addition, the comments to the questions have been compiled and revised with a special data programme.

9 RESULTS

The account of our results will be made on the basis of the hypotheses which were presented in 6.3. A comparison with results from the study of the original material will also be presented. Finally, the outcome of the student teacher inquiry will be related.

9.1 Comparison between pre- and post-recordings of the experiment group

The hypotheses which were primarily studied in the Swedish study were the implications, that the teacher skills which the minicourse treats are employed to a greater extent after the completion of the course. In Table 9:1 we give an account of how the average values of the different variables have been changed from pre- to post-recordings. The differences have been t-tested and the t-value has been marked by * and ** respectively for the variable, where the difference is signifikant on a level of 5% and 1% respectively.

Table 9:1. t-test of the difference between pre- and post-means for the experiment group

	Pre-test	Post-test	t
1. length of pause/question	1.88	3.72	6.70**
2. word/pupil-response	10.93	9.19	-1.31
3. non-punitive reaction	0.44	1.39	2.67**
4. punitive reaction	0.76	0.72	-0.13
5. redirection	23.11	31.75	2.22*
6. proportion of fact questions	0.38	0.49	2.13*
7. prompting	0.92	3.50	2.95**
8. further clarification	3.73	4.77	1.12
9. re-focusing	0.0	0.04	1.00

Table 9:1 continued

	Pre-test	Post-test	t
10. repeats own questions	3.72	2.92	-0.92
11. answers own questions	0.52	0.22	-1.28
12. repeats pupil response	9.47	2.59	-4.11**
13. percent teacher talk	37.27	27.48	-3.79

Table 9:1 shows that somewhat more than half of the variables, which have been tested, demonstrate statistically significant changes from pre- to post-recording. Even those variables which do not show significant differences have in most cases changed in the expected direction. We have reason to comment on the results which are shown in the table.

As has been mentioned, three skills are treated in each instructional sequence. In the first, there are the skills: pausing behavior, calling on both volunteers and non-volunteers, as well as non-punitive reaction to incorrect pupil response. The second has been omitted from the three. The reason for this is that this skill, could not be registered with the help of a camera alone. The other skills which are included in instructional sequence 1, i.e. pausing behavior and the non-punitive reaction to incorrect pupil response, appeared significantly more often after the course. The change regarding non-punitive reactions, is not, however, of any great practical importance, as so few total incidents are included in both of the recordings. On the other hand, it is conceivable that this change has a certain psychological importance for the atmosphere in the classroom.

In the case of those skills which are included in sequence 2 on the redirection technique, framing questions which demand longer pupil responses, asking higher cognitive questions - the picture is clearer and in some respects gives an impression full of contradictions. It is completely obvious that the subjects have learnt the redirection technique (no 5) and that the amount of teacher talk has decreased. If we look at the quality of the questions, the results do not go in the direction expected. It is to be expected that the proportion of factual questions should

decrease and that the proportion of higher cognitive questions should increase. Instead, the tendency is in the other direction, and in the case of the proportion of factual questions in the total number of questions, the difference is statistically significant (no 6). It would seem that sequence 2 did not function so well. There is reason, however, to suppose that this conclusion is only superficially correct. Part of the explanation of these results probably lies in the manner in which the student teachers chose their topics of discussion for the pre- and post-recordings. As has been mentioned earlier, no other instructions were given than that they should have discussion teaching with their class for about 20 minutes. Going through the choice of topics, it can be found that a greater part of the student teachers had chosen free topics of discussion such as mobbing, rules of order, showing respect, pollution etc for the pre-recordings. In the post-recording there was a noticable change towards more factual topics such as the flora of Africa, the stone age, classical Rome. This must, of course, have influenced the result of the discussion. If one is conversing about mobbing, it appears rather natural that the teacher should use questions such as explain, describe, how, why, how does it feel, interpret, that is, questions which in the handbook are defined as higher cognitive questions. The material is here emotionally charged, and the pupils can be expected to have many viewpoints. Greater demands are placed on the teacher in conversation about classical Rome, and the pupils can no longer use their own experiences or feelings to give detailed answers. It would, of course, have been desirable if the conditions during the pre- and the post-recordings had been more similar, but that has to be weighed against the disadvantage of more directly steering the contents of these lessons. The intention was, of course, to get a situation which, as much as possible, seemed to like a regular lesson with discussion teaching.

Instructional sequence 3 with the skills of prompting, to get further clarification and to refocus have, as far as can be seen in the results, functioned satisfactorily. Of these three probing

techniques, the last mentioned does come only a few times in the whole of the material, which, in addition, was also the case in the American study. Those occasions on which this technique was adopted were, however, in all cases on the occasion of the post-recording. As far as the other two are concerned the differences between the pre- and post-recording results is the one we expected.

Instructional sequence 4, finally, did also have the effect intended. In this case, a decrease in all three of the bad habits treated can be noted. In the case of repeating pupil response, a very marked decrease can be noted.

The general impression from these comparisons is without a doubt that the minicourse has had a very good effect. This conclusion is supported by the results which are given account of where comparisons are made between experimental and control groups.

9.2 Comparison between the experiment and control groups

Even in the control group, differences between pre- and post-recordings of the same variables were t-tested as for the experiment group. In none of the variables is there to be found a statistically proven difference. (See Appendix F)

The comparison between the experiment and control groups is of greater interest. Twelve variables were chosen for this comparison, variables which covered each and every one of the skills in the course (excluding, as has been mentioned, the skill of calling on both volunteers and non-volunteers). The variable percent teacher talk was also included, as it can be seen as a kind of universal measurement that the course arrived at those points intended. These variables were included in a covariance analysis, which was made in order to test the difference between post-recording values in both the groups. An account of the result of this analysis is given in Table 9:2 and is graphically illustrated in Fig 9:1. The figure shows clearly that the gap

between the two groups had widened at the time of the post-recordings. This is noticeable even in the greater part of the variables, where no proven statistical difference can be shown. It may be worthwhile to comment upon the figure somewhat. The variable number of words per pupil response shows a significant difference, but in an unexpected direction. Instead of finding more exhaustive pupil responses in the experiment group, a decrease in the number of words per pupil response was noticed. The background to this is probably the displacement in the choice of topics of discussion in the experiment group. This is, however, the only noted deviation from the expected results. Otherwise, the figure can speak for itself. A reasonable conclusion seems to be that the minicourse throughout has produced the intended behavior alterations in the participants in the course.

Table 9:2 Covariance analysis. Experiment - control group.

	F	P <	
Pause/question	11.55	0.002	xx
Words/pupil response	5.08	0.032	x
Non-punitive reaction	0.24	0.627	
Punitive reaction	1.10	0.303	
Redirection	8.11	0.008	xx
Percent factual questions	0.73	0.401	
Prompting	3.59	0.069	
Further clarification	0.16	0.692	
Repeats own questions	0.02	0.897	
Answers own questions	4.58	0.036	x
Repeats pupil response	8.57	0.007	xx
Percent teacher talk	16.29	0.001	xx

F=7.149 P < 0.001 df=12.17

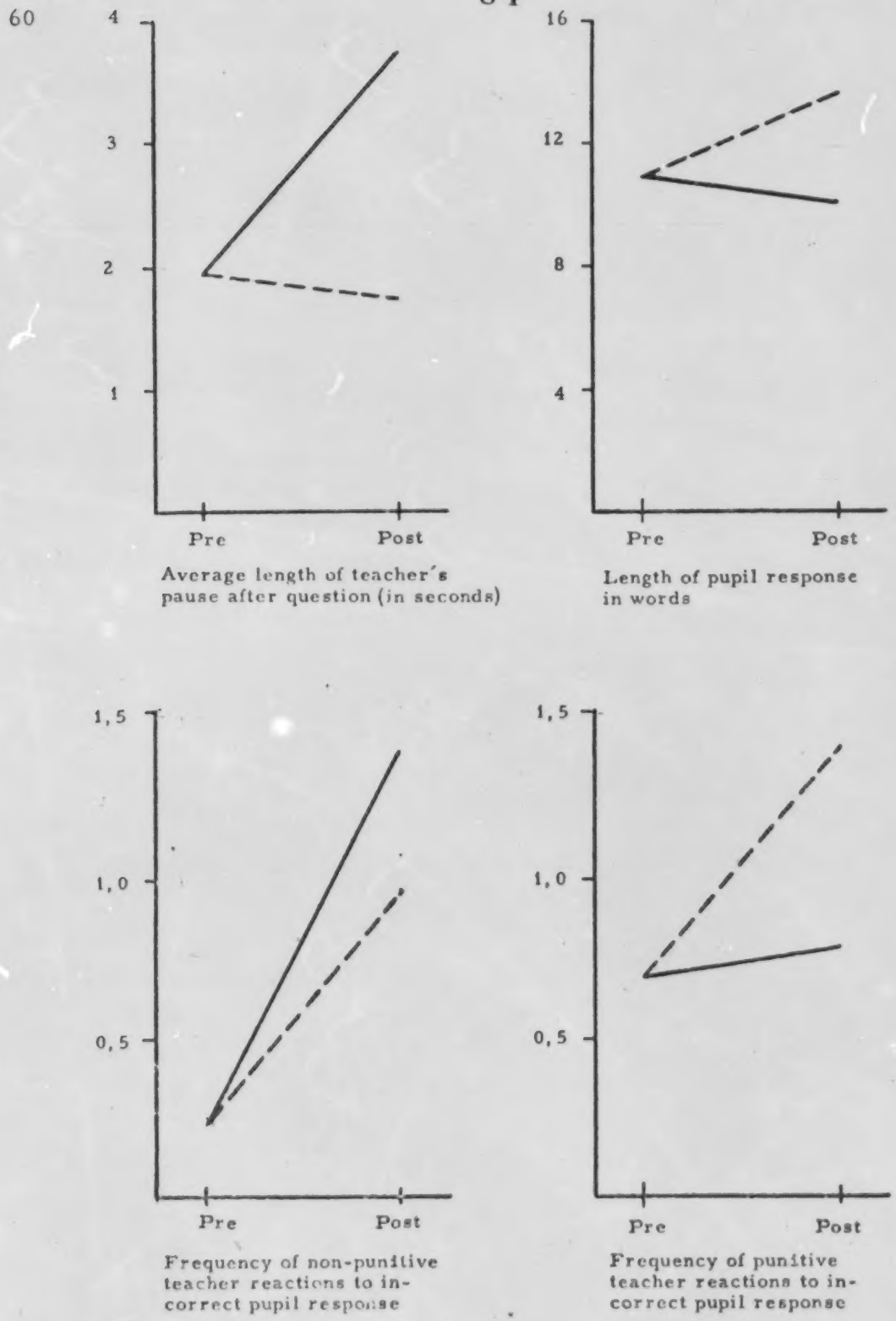


Fig 9:1a. Means for the experimental and the control groups adjusted for differences in the pre-recordings

——————— experimental group

- - - - - - - - - control group

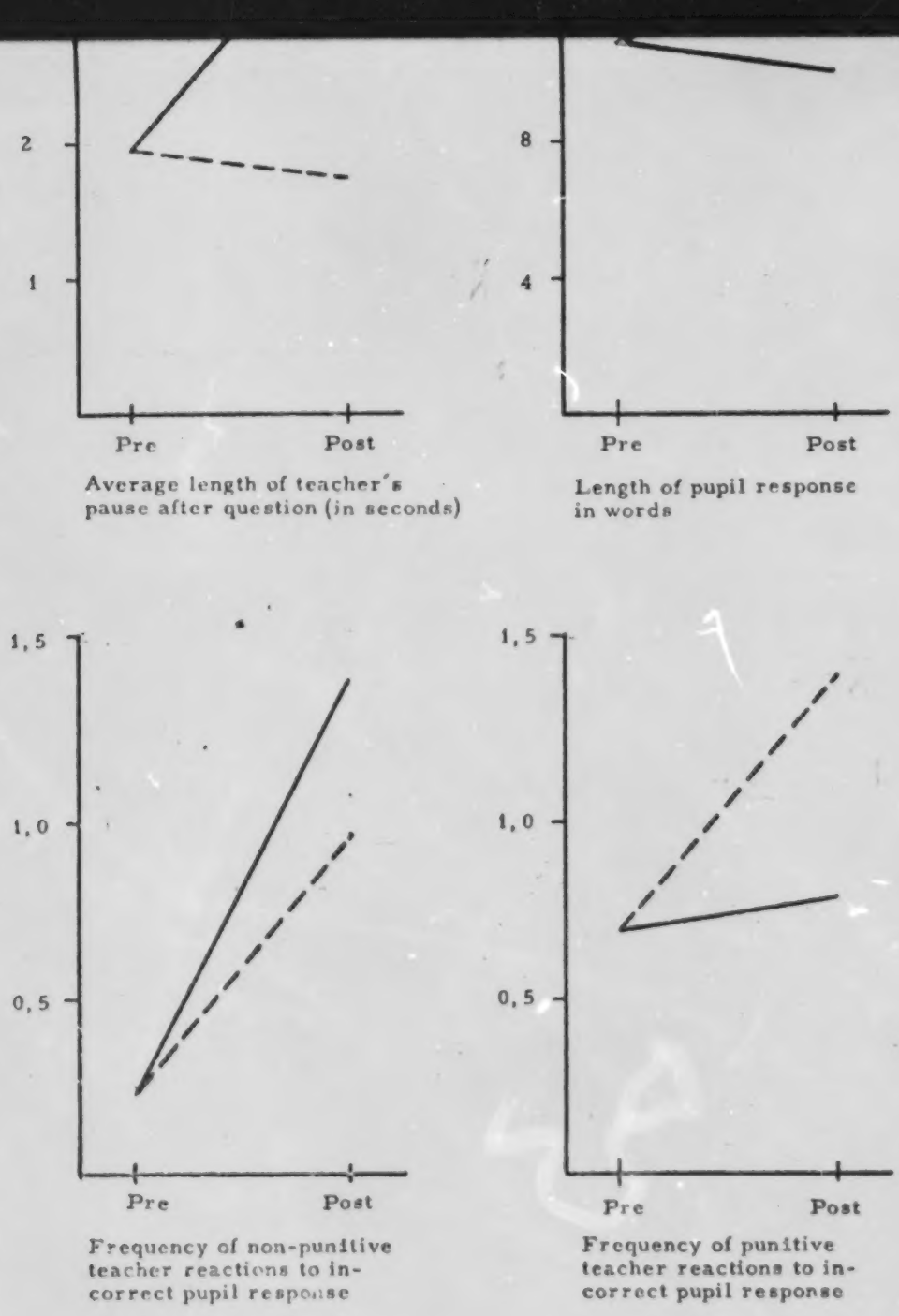


Fig 9:1a. Means for the experimental and the control groups adjusted for differences in the pre-recordings

——————— experimental group

- - - - - - - - - control group

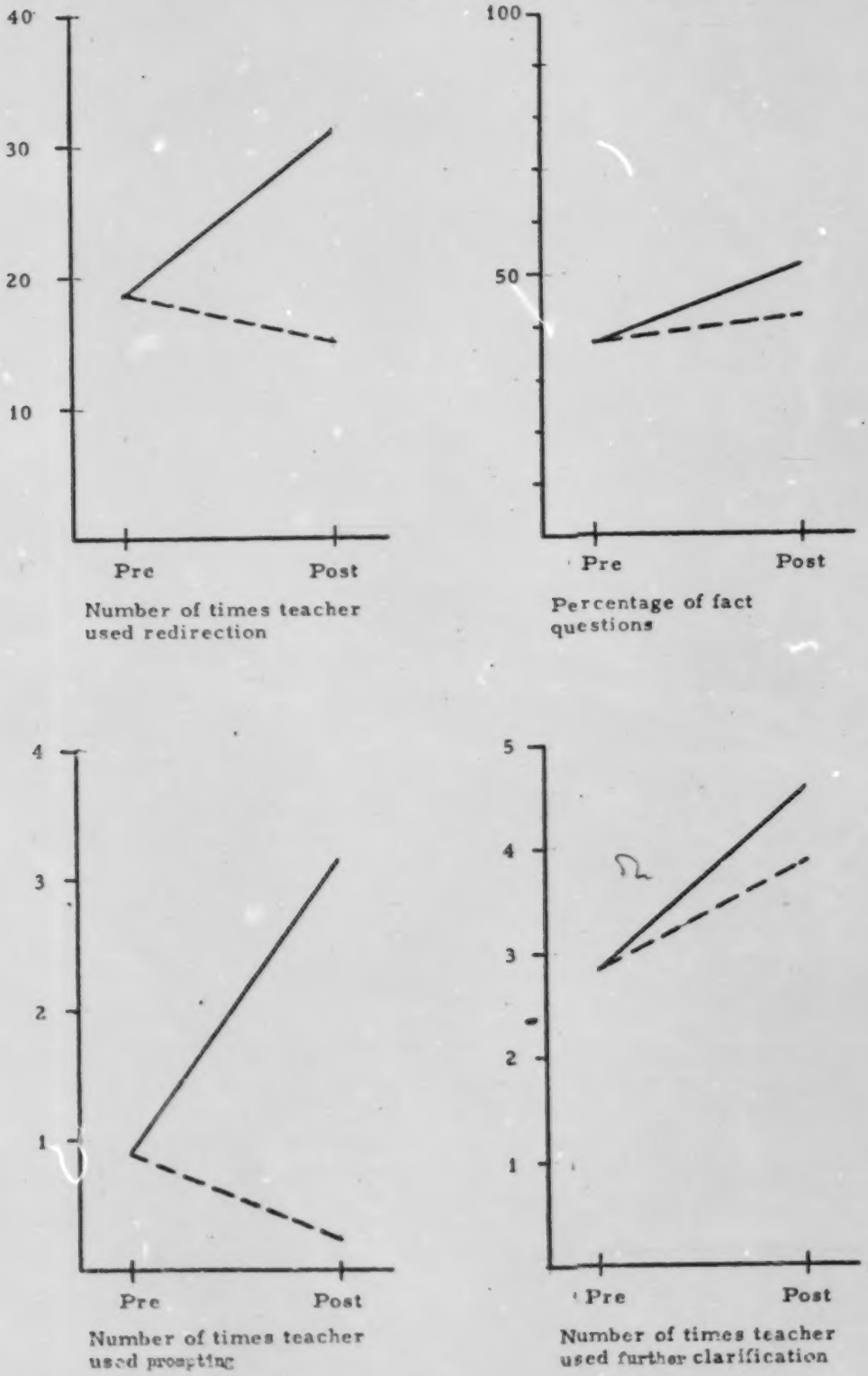


Fig 9:1b. Means for the experimental and the control groups adjusted for differences in the pre-recordings

——————— experimental group

- - - - - - - - - - - control group

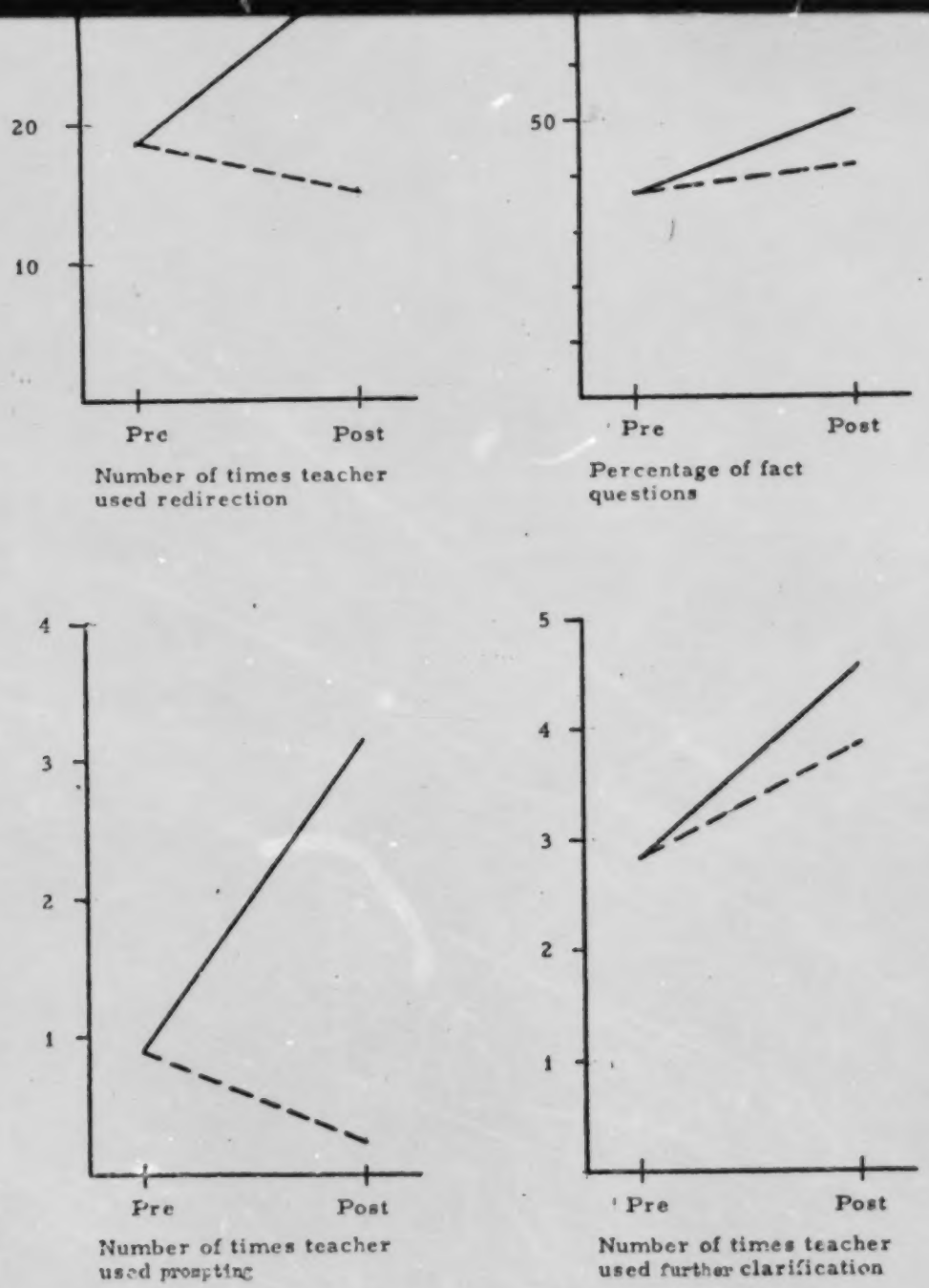


Fig 9:1b. Means for the experimental and the control groups adjusted for differences in the pre-recordings

——————— experimental group

- - - - - - - - - - control group

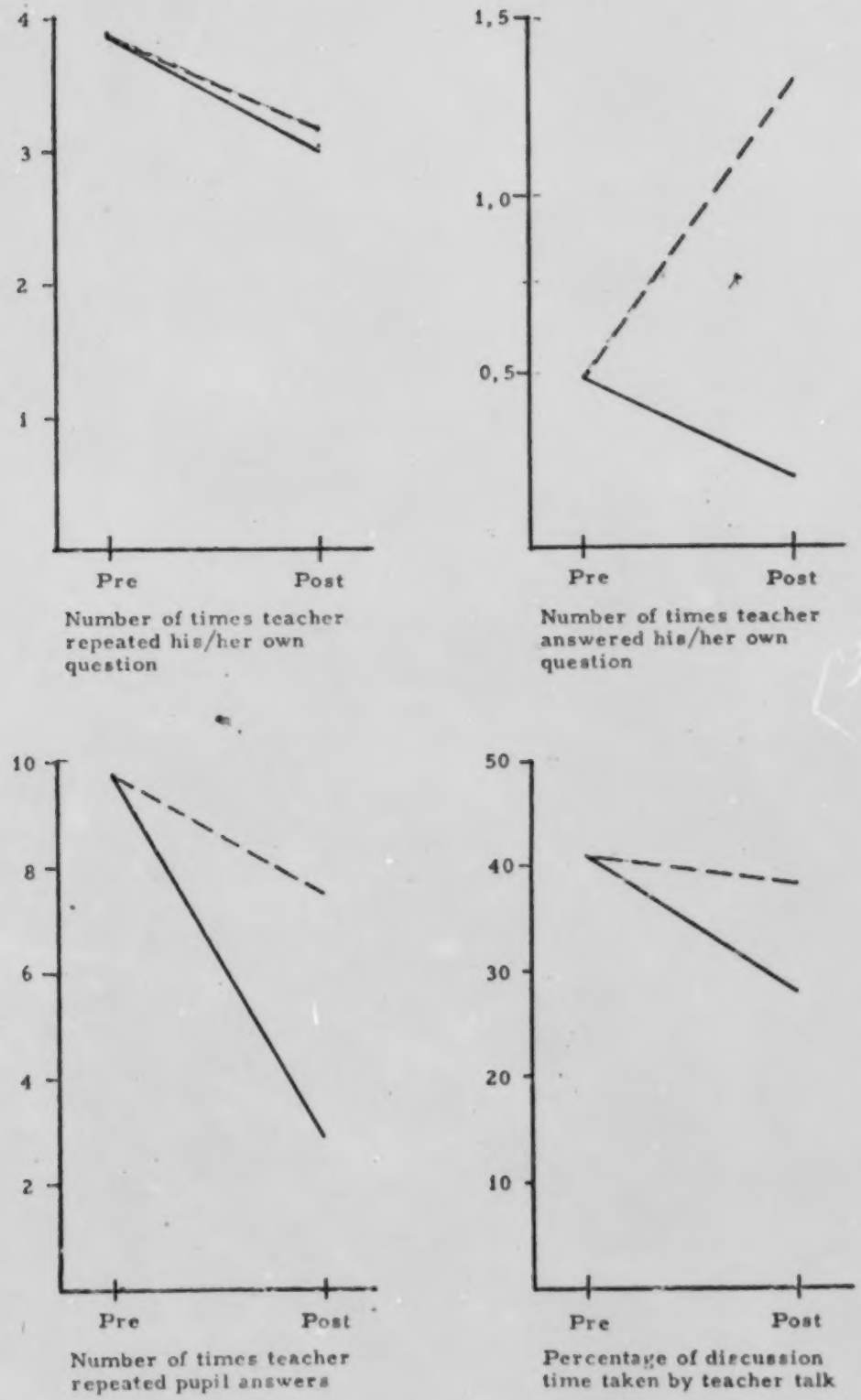


Fig 9:1c. Means for the experimental and the control groups adjusted for differences in the pre-recordings

——————— experimental group

- - - - - - - - - - control group

9.3 Comparison between the Swedish and the American minicourse-studies

A comparison of the results between the Swedish study and the original results from Far West Laboratory is, of course, of great interest. There is perhaps reason to recapitulate somewhat under what conditions the two studies were carried out. At Far West the study was made on 48 inservice teachers teaching in grades 4 - 6. The course was part of inservice training. No information about which instructions were given before the 20 minutes long pre- and post-recordings, is available. The trial plan included only an experiment group. In Sweden the study was made with 32 student teachers during their next to last term of education, when they had practice teaching in grades 1 - 6. They received instructions that the pre- and post-recording would be made during discussion teaching. The recordings were made 15 minutes long and were carried out, not only in the 32 experiment classes, but also with 10 control subjects.

A compilation which presents the results, partly from the Swedish study's experiment and control groups, partly, the American study experiment group, has been made in Table 9:3. No numerical values have been given account of, because they can not be seen as comparable. Instead, a mark has been made for the differences which are statistically significant in the three groups.

Table 9:3. Comparison between Swedish and American results

Skill	Exp gr	Contr gr	Far West
Pause length	xx	0	xx
Words/pupil response	0	0	xx
Non-punitive reaction	xx	0	0
Redirection	x	0	xx
Proportion factual quest	x (wrong direction)	0	xx
Prompting	xx	0	xx
Clarification	0	0	xx
Refocusing	0	0	0
Answers own question	0	0	xx

Table 9:3 (continued)

Skill	Exp gr	Contr gr	Far West
Repeats own question	0	0	xx
Repeats pupil response	xx	0	xx
Percent teacher talk	xx	0	xx

0 = non significant difference
x = significant on a level of 5%
xx = significant on a level of 1%

As the table shows, the number of significant differences is greater in the American study. Only in the case of the variable refocusing did none of the groups reach any alteration. It will be of great interest then to see other national studies - both Holland and Great Britain are studying minicourse 1 - in order to see if the difficulties of adapting this skill are as general as they appear to be. Furthermore, the Swedish group can state the fact that the Swedish results of the study are comparable with the American results. Something which supports the assertion even more, is the result of the inquiry, which was filled in by the Swedish participants and which is given account of in sequence 9.5.

9.4 Comparison between the participants on the junior and middle levels

One difference between the Swedish and the American versions of the minicourse is that the former has even been adapted for use on the junior level. Therefore, it was of especial interest to see if any level-difference can be noted with respect to the trained teaching skills. Another reason for which this analysis has been of interest was, that the junior level student teachers, unlike those at the middle level had not applied voluntarily, but had, with few acceptions, had to be recruited for participation. It can then be assumed that the middle level student teachers were in the beginning more motivated and had greater confidence in the minicourse as a worthwhile contribution to teacher education.

This in its turn would mean that their readiness to enjoy the benefits of the course was greater. Despite the junior level student teachers' somewhat cooler involvement at the start of the course, their reactions after having completed the course were as positive as those of the middle level student teachers. (See also 9.5)

In order to investigate if the levels differed in regard to behavioral alterations, covariance analysis of the post-recording values was made in both groups. The result is shown in Table 9:4.

Table 9:4 Covariance analysis. Junior - middle level.

	F	P<
Pause/question	0.15	0.701
Words/pupil response	2.84	0.109
Non-punitive reaction	0.05	0.826
Punitive reaction	0.51	0.484
Redirection	1.12	0.305
Proportion factual questions	3.41	0.081
Prompting	0.37	0.553
Further clarification	0.19	0.667
Repeats own question	1.23	0.283
Answers own question	0.002	0.966
Repeats pupil response	0.07	0.800
Percent teacher talk	0.009	0.925

F=2.619 P<0.104 df=12.17

As is shown, no statistically proven differences are to be found here.

9.5 Results of the inquiry to the participants in the course

There was a two-fold purpose to the inquiry. Partly, viewpoints were desired from student teachers on the minicourse as a whole, partly, it was thought interesting to find out how those, who had experienced the course, looked at certain problems, which had to be illuminated and preferably answered before the continued use of the minicourse.

The inquiry was sent out to student teachers a short time after the end of the course. The thought was that they then should have had time to gain perspective about the course and should be able to give a complete picture of it. The response frequency was high and of the 32 participants in the course 27 filled in the inquiry. The questions were partly open, partly multiple choice questions. (See Appendix C)

Short, concise answers were given on the open questions and these will therefore be given account of in extenso. The first question - What is your general impression of the minicourse as a contribution to teacher education? - gave the following answers.

- Useful to see oneself in action.
- It was useful to see oneself. One can change certain behaviors.
- The course gave me more than I had hoped. It took up things which were useful and worth thinking about for the future teacher.
- On the whole, very good! I became conscious of what is important in teacher behavior.
- A very good and important course which can give more than hundreds of lectures in the same subject.
- The course gave me a great deal.
- It should be included as an essential part of teacher education.
- Good and instructive.
- The course is a very welcome contribution to the otherwise so theoretically ponderous teacher education.
- Something which all student teachers should be given the opportunity to use.
- Very good to see oneself in action, I'd have wanted to have more time to digest the different techniques.
- Profitable. One saw himself among the pupils, discovered what behavior one had and so on.
- Good and much needed.
- It is much needed even if it was bothersome to have it during the practice term.
- Very good in teacher education.

- Definitely think it was good and should be included. Perhaps, it should be repeated in some form.
- It should be obligatory for all student teachers.
- Very positive. A different kind of field work which was stimulating and valuable.
- Very much over my expectations.
- Good!
- Should be obligatory for everyone.
- Good.
- Useful. Should be a part of teacher education.
- Everyone should have a chance to take the course.
- Very positive. It gave a great deal. I became conscious of a lot of things which I had not thought about before.
- To see oneself gives one much more than listening to the supervisor's or the methods teacher's comments.

The responses accounted for here show with all desirable clarity, that the minicourse has met with extraordinarily positive acceptance. It is obvious that it has met a need from the student teachers. A strikingly large number of the responses even imply that the course should be made obligatory in teacher education:

But what is there in the minicourse that makes one react in this way? The inquiry's second question gives an answer to that. The question was: What did you derive most from in the minicourse? And the answers were:

- The possibility of critically observing myself.
- Instructional sequence 4.
- The first lesson each time.
- Instructional sequence three on how to handle incorrect and incomplete pupil responses.
- To be able to see in black and white the way in which a successful lesson should be carried out.
- I learned to know the children better, learnt to ask questions in a better way, learnt to criticize my way of working.
- A sensible questioning-technique.

- The possibility of training detailed and concrete skills on my own. Being able to evaluate these with some indirect guidance was very much worthwhile.
- Got to know my own questioning technique, got to know the pupils.
- Different ways to ask questions, activate more of the pupils and get them to say more.
- Very good contact with the pupils.
- Of the way to ask questions.
- One becomes conscious of his own short-comings and becomes conscious of how to reach the goals one seeks.
- One becomes conscious of how one asks questions of the pupils.
- What I have tried to concentrate on is above all in asking questions, is calling on volunteers and non-volunteers and trying to avoid getting yes/no answers.
- I think it was good all the way through.
- Seeing the model lessons and then comparing with ones own lessons.
- Seeing in a concrete manner how I ask questions and answer the childrens' questions.
- The sequence about repetition of pupil responses. How one allows the discussion to flow without the teacher talking in between.
- Think more about how to ask questions in order to get the best possible answers.
- The handbook.
- The chapter on repeating the pupil responses, repetition of questions.
- The recorded lessons and my own.
- Instructional sequence 4.
- That the children and I learnt discussion technique. The children give exhaustive answers, answered each other. I talk less myself.
- I became aware of the importance of asking questions in the right way. (Classification and differentiation of questions).
- The sequence on redirection, to give prompts and not repeat the pupil responses.

Judging by these responses it was the microteaching part of the course, but above all its contents, which they thought they profited most by. The microteaching itself and the possibility of feedback on one's own teacher behavior, is seen as one very worthwhile experience. Getting concrete, detailed descriptive teaching skills to train, skills which one notices have an effect on the pupils, is experienced by many student teachers as the most positive thing about the course. They have expecially appreciated two sequences in the contents of the course. One of these is the sequence of the probing techni·ques, that is, those skills which aim at helping individual pupils to give complete responses. The other is the sequence, , which treat the bad habits of the teacher, which prevents the flow of the classroom discussion. It is also of interest to note that so many student teachers mention the fact that the course has side-effects of a social value. They have obviously very strongly felt how the contact with the pupils has become better by being able to meet them in small groups.

After all these positive remarks, one can ask himself if perhaps nothing in the course was questioned. In the inquiry there was the third question: What was not so good about the mini-course? Five student teachers failed to answer that question. The others answered in the following way:

- Having to see the model lessons again, also the revised lessons. It became repetitive and was not as engaging as the first time.
- Would have been better to do the course in the middle of term.
- Instructional sequence 1, especially the sequence on how to handle incorrect or incomplete responses.
- No short-coming as far as I can see.
- It is difficult to adapt in the first and second grade.
- The slow instructions. Reteach lesson didn't give particularly much.
- The instructional programmes were possibly a little overly ambitious, certain alternatives to the self-evaluation were diffuse.

- So little time. Both the pupils and I would have needed more time to digest our experiences.
- Time. I felt hurried.
- Took pretty a long time in the beginning of term, when one had the most work to do.
- The situation was artificial and the result is too good to be compared with a classroom situation.
- It was perhaps not so well explained which subjects one should include when the programmes were recorded.
- The reteach lessons.
- Not everything was suitable to adopt in a first grade in the autumn.
- For my part I had first graders which made the discussions difficult to execute.
- Since it was a while since I did the course I don't remember what wasn't so good.
- Refocusing.
- The recorded lessons were so exhaustive that the model lessons were a bit superfluous.

One negative feeling is obviously the lack of time which many of the student teachers experienced. There was, in fact, in the plan of the minicourse rather little space for unexpected situations. The project group experienced the same time-pressure as the participants in the course, as all the three minicourse turns had to take place within the same term. As far as the contents of the course, it seems as if the reteach lessons were not felt to be as meaningful as other parts of the course. There was a very special category of answers to the question what was not so good about the course, and to this category belong those responses, which were given by the student teachers teaching in the first grade. They report certain difficulties in adapting the course for such young pupils. It is, however, interesting, that the three student teachers, who have expressed this sentiment, state their general impression of the minicourse as "Very positive", "Very much over my expectations" and "It should be included as an

essential part of teacher education."

The last open question - What improvements would you like to suggest? - was responded to by only 15 student teachers but as a rule they answered rather thoroughly.

- To be relieved from seeing the model lesson more than once. To be relieved from the first self-evaluation form in each sequence.
- More model lessons from the first, second and third grades.
- Omit instructional sequence 1 and place more weight on instructional sequence three, which in a much better (and more difficult) manner, shows how to treat pupil responses.
- Clear, short written instructions. With criticism of someone from the department of pedagogics on at least two occasions.
- 1) More time. 2) Visit by a methods teacher a few times, not for getting any direct help, but in order to discuss experiences one has had and perhaps to get some individual counseling, which the minicourse can not give. 3) Follow up during last term of teacher training.
- More time. A little more variation in the demonstration programmes, they can most certainly be done in a lighter manner.
- Longer time schedule. More help with the choice of subjects. It was a little bit difficult to find a good subject each time.
- Increased steering of the choice of topics, depending on which grade you are teaching. For example, to give three or four suggestions for each lesson, which one can take if one doesn't have any better suggestions himself. Some kind of review about six months after during the teacher education.
- Gladly suggestions as to topics which are suitable for treatment in the micro-lessons at the junior level.
- Perhaps, a longer time schedule for the minicourse. Sometimes it was burdensome, for example when the methods teacher came. Otherwise, I thought everything flowed smoothly.
- The minicourse should come in the middle of the term when one knows the pupils a bit and when there is time to carry out the recordings in peace and quiet.

- Possibly a correction of the instructional programmes. They were somewhat superfluous.

The time factor plays an important roll in several of these suggestions for improvement. It is obviously the case that many felt the need to have more time. Another desire is the suggestion for topics of discussion for the micro-lessons. Some student teachers express the desire for complementary individual guidance. There are also views on the adjustment of the material.

It can appear that the result of this rather unambitious inquiry is accounted for in rather great detail. We think, however, that these results are quite as interesting as the results in the form of factual behavioral alterations, as has been described earlier. They can quite surely be interpreted in such a way that there is a true need for this sort of contribution to teacher education, nota bene if the contents, which, as is the case in the minicourse, is of the type that according to current criteria ought to be paid attention to in teacher education.

The inquiry responses, which we have here given account of are, however, only a part of the information we wanted to reach. There were also some multiple choice questions. Answers to the question, when the minicourse should be introduced, are distributed among the 27 student teachers who filled in the form, as follows:

in the beginning	6
in the middle	16
at the end	2
as in-service training	3
at other time	2

Of those three, who have chosen in-service training as the best time, two have also marked another alternative (in the "beginning" and in the "middle" respectively). The two student teachers who have stated "at other time", have pointed out that the course ought to come when the student teacher has been practising for a few weeks.

The following question concerned whether the participants felt a need to have an assistant judge during the evaluation of the micro-lessons. Result:

yes, from the supervisor	3
yes, from the methods teacher	3
yes, from a teacher of pedagogics	3
yes, from someone in the minicourse project	4
yes, from a colleague	11
no, not at all	13

Those three student teachers, who wished to have views from a supervisor, also noted one or more alternatives. Such was also the case with the three who stated "methods teacher" in their response. One student teacher wanted help from all of the categories. Responses for a colleague are as a rule single alternative responses, that is no other alternative is marked at the same time,which is also the case of the last response alternative. It should perhaps be pointed out that it is suggested in some of the minicourses' evaluation forms that the micro-lesson should be discussed with another participant in the course.

Has the minicourse - after the beginning instruction been completely self-instructing? Answers to this question were unequivocal:

yes, both as for the contents and technically	23
yes, but only as for the content, not technically	4

Only four of the student teachers think then, that the course has not functioned well purely technically. All think that the contents have functioned self-instructionally.

It was, for the sake of continued used of the minicourse, of interest to know which grades the student teachers thought would be most suitable to provide pupils for the training period. Responses to this question were marked according to grade in this way:

first grade	1
second grade	6
third	12
fourth	18
fifth	18
sixth	17
other suggestion	1

As is shown, many of the student teachers have marked several response alternatives. If we check the forms closely we will find that the notations in many cases have been made for the student teacher's own grade and all grades above it. This explains the predominance of the middle level grades. One student teacher also suggested that secondary school classes should be included.

The next to last question was: Do you think that profiting from the minicourse demands that you know the pupils who are to be micro-taught?

The responses were distributed in the following way:

yes, this is a pre-requisite	8
yes, it is a pre-requisite for certain instructional sequences	7
no, but it is an advantage	11
no, it is of no importance	1

It is obviously felt that it is rather important that the pupils who are going to cooperate in the training period are not completely unfamiliar.

Finally, it was of interest to receive views on what part of the teacher training most naturally should include the minicourse. The answers to the inquiry's last question were as follows:

in pedagogics	6
in methods courses	18
unimportant	5

Four student teachers have noted both pedagogics and methods courses. In other cases, the results speak for themselves.

10 THE MINICOURSE IN TEACHER EDUCATION

One of the objectives of the Swedish adaptation and testing was to illuminate the practical pre-requisites for a more general use of the minicourse as a learning system in teacher training. This could hardly be done in any other way than by deliberations and discussions of a long series of concrete questions. Just which these questions are, and how we through argumentation tried to answer them is shown in the Chapter at hand.

10.1 At what time during the education should the minicourse be offered?

A great number of demands of a practical-administrative character have to be met before the minicourse will function satisfactorily. For example, there must be suitable premises available, so that the technical equipment all the time is ready for use. There must be pupils available for the microteaching, pupils who preferably are not completely unfamiliar to the student teacher. 5-6 pupils at a time for only 5-10 minutes at a stretch are needed, and there must, therefore, be a substitute teacher who can take over the rest of the class during this time. It is most likely easiest to meet these demands, if the minicourse is placed during one of the longer practice periods during the education. During the testing of the course it became apparent that only in exceptional cases was it possible to carry out the work within the space of 15 days, as was the estimated time allotted for the course. It showed itself to be difficult to get so many consecutive working days due to, among other things, a number of unforeseen situations, such as holidays, sickness, visits from the School of Education etc. At least four working weeks was a more realistic time schedule. Therefore, we have to find practice periods of at least this length during the teacher education. For this reason two alternatives appear conceivable. The first is the period of six weeks which lies at the end of the third term of education. The second period includes the first 13 weeks of the last term.

What further speaks in favour of these longer practice periods, is the frequently expressed desire on the part of the student teachers - both in the inquiry and during personal contacts with the coordinator - that a longer time should be made available for the course. This appears to be in agreement with those views which came out during the American study. In that case, they have taken the consequences of this and nowadays recommend that only three days per week be scheduled for the minicourse (Borg et al 1970 p 93).

The question can be raised as to whether either of these two practiceperiods is a better alternative than the other. When the student teachers were asked about what time during the education they thought the minicourse should come in, 16 of 27 answered that it should come in the middle of the education. Only two student teachers would prefer to have it at the end. This would imply that the practice period during the third term should be the better alternative. If, however, we imagine giving as many student teachers as possible the chance to take the course - a frequently expressed desire in the inquiry - even the final term's practice period should be seen as a realistic alternative. Otherwise, there is also the possibility of placing the course after graduation. In its American version the minicourse has been most used for inservice training. Such an area of use would likely not be inconceivable for the part of the Swedes, either.

10.2 How can the minicourse be integrated with other parts of the teacher education?

The study of the minicourse took place during the student teachers' practice term. In the new set-up of practice, which takes effect in Swedish teacher training beginning in the autumn of 1974, the practice term has another form, as is shown in the preceding section. For the student teachers the minicourse was included as a part of their course in pedagogics. It was counted as an alternative to the obligatory field work in pedagogics, which the student teachers carry out during the practice term. If one desires

an answer to the question of how the minicourse could be integrated with the other parts of the teacher education, one has not got much help from the experiences made during the study, since the prerequisites have already changed.

If we go back to the Plan of Education for Swedish Teacher training (1971), we find that teacher education consists of four main parts, namely subject studies, pedagogics, methods and practice. It can then be asked if anyone of these parts is more suited than another to include the minicourse. The subject studies can most surely be ignored in this connection, since the aim of it in the first place is to give student teachers more intensified knowledge of "... such subject material as the different subjects, according to the school curriculum, includes ..." Consequently pedagogics, methods and practice remain. These parts are naturally not independent of each other. One can perhaps still lead the discussion with a view to those goals and instructions, which are stated for the respective parts.

The practice part of the teacher education appears most plausible to begin with and it has already been established that the minicourse of practical-administrative reasons must be placed in a practice period. The practice part of the teacher education should among other things have as a goal to "... develop in the teacher the ability to critically check his/her own teaching results, as well as the ability and the will to alter the same, based on such a check as mentioned". In the directions for practice teaching it is further stated: "The analysis and evaluation of the practice teaching should be built upon training the student teacher to criticize his/her own teaching, draw conclusions and seek solutions, which can lead to bettering him/herself as a teacher." Of what is stated above it appears obvious that the minicourse should be integrated with the practice part of the teacher education.

"The practice part of the education should be arranged together with the study of pedagogics and methods" it says further in the education plan. What consequences does this have for the part of the minicourse? To begin with, it can be stated that it must

reasonably be considered an advantage, if one can somewhat prepare and follow up the minicourse in pedagogics and/or methods courses. Nothing in the goals for these two parts of the education contradict that assertion. One of the goals for the study of pedagogics is for example to "... give the student teacher skills in evaluating teaching in relation to goals present, as well as to analyse the reason for possible failure to reach the goals." Within the goals for study in methods it is stated among other things that one should "... develop in the student teacher an analytical attitude towards different teaching situations as well as the habit and ability to choose a suitable form for the teaching with due respect to the pre-requisites." The student teachers themselves have expressed in the inquiry a clear preference for methods. 18 of 27 student teachers think that the minicourse most naturally belongs within the methods courses. It is however important to point out that the student teachers in this case do not express a desire for guidance during the course. In the inquiry only a few have expressed the need to have a supervisor, a teacher in pedagogics or in methods as an assistant critic judge in the evaluation of the micro-lessons. The background for the view, that methods is a natural place for the minicourse, is more than likely, that those skills which the course treats, are seen first and foremost as methodological operations, although anchored in pedagogical theory and empiricism.

A recommendation is that the minicourse and its possible successors are placed in the practice part of the education, is administrated by one or more independent coordinators and is anchored in both methods and pedagogics teaching. The course would in this way be able to function as a bridge between theory and practice in teacher education.

10.3 Which student teachers should be given the opportunity of taking the minicourse?

In choosing subjects for the Swedish testing of the minicourse it was considered essential to have voluntary participation from

the student teachers. Partly there were no economic possibility for making a random sampling, partly, it was not considered possible to oblige the student teachers to accept the extra work-load, which implied both taking the minicourse and taking part in the testing of it. For this reason, it is difficult to say anything about which student teachers will in the future have the possibility of taking the course. An attempt will, however, be made here to somewhat illuminate the question. One starting-off point can be to listen to the student teachers' views on the question. In the first question in the inquiry about the general impression of the minicourse, many were of the opinion that the course should be available to everyone. Some even wanted to have it as an obligatory contribution to the teacher education. Certain criticism toward the project group has also been expressed because only 32 student teachers were enrolled for participation. Contrary to what might be expected this criticism has for the most part not come from those student teachers who volunteered but could not be accepted. Instead, it is those, who from the onset were disinterested, that have raised the strongest objections to the manner of selection. It is obvious that the positive reactions from the subjects have had a wide-spread effect. There is, of course, no principal objections to be raised on the part of the project group, that all student teachers at some time during their education are given the chance to take the minicourse. There are, however, two problems to be considered here. The first is of an economic character and as such perhaps difficult but not impossible to solve. If it is found that the minicourse is of such great value, that is should be included as an obligatory subject, then resources should be made available so that this wish can be satisfied. The other problem is of a more intricate nature. If the course can be conceived of as obligatory, can one then even expect a positive result from the student teacher, who is made to take the course against his will? Another dilemma is that, even if everyone is given a chance to take the course on a voluntary basis, we can still not ignore the possibility that certain student teachers will not take advantage of the opportuni-

ty. In both cases it can be that just those teachers who have not taken advantage of the possibility are judged to be the ones most in need of the course.

It will even be more complicated if there are insufficient resources to offer the course to all student teachers. Should we then assign by lot on the possibility of participating, from among those who volunteer for the course, or should we primarily direct ourselves to those student teachers who are considered to be most in need of the course? If we choose the first alternative, how shall we then diagnose this need? One possibility would be by way of inquiry to student teachers try to determine where the need is greatest. Which student teachers have for example the least amount of earlier teaching experience, experience of being together with children, confidence in their own ability to teach etc. Another possibility would perhaps be to allow the supervisor and/or the methods teachers to estimate this need. Such a solution appears, however, less than attractive. One must reckon with the fact that the subjectivity, which is built-in in such a way of going-about the matter, can have negative consequences. It would be particularly unpleasant, if the student teacher interpreted an offer to take part in the course, as a sign that they are considered to have less than good prerequisites to be good teachers. We can then not give any final answer to the question to which student teachers should take the minicourse during his/her education. One can hardly give any general recommendations. For the time being the question must remain open.

10.4 <u>With the present resources, how many student teachers can take the course?</u>

As a result of the minicourse study it was possible to establish that with the five sets of equipment available thirty-two student teachers could during one term go through the course but under great pressure of time. This would seem to be an adequate

answer to the question in the heading. As was mentioned earlier, however, the conditions are no longer the same. The study was carried out during the practice term of the student teachers. This term is no longer a part of teacher education, but has been replaced by a number of practice periods, the longest of which is thirteen weeks. Since this new practice set-up does not take effect until the autumn term 1974, we do not yet have any experience which tells us, if the situation changes in a way which affects the minicourse. It is for example uncertain how many student teachers one can count of finding at one and the same time at the same practice school for a long enough practice period. The more participants there are at each school, the better each set-up of equipment can be used. One doesn't know either if the practice schools will in future be situated nearer the School of Education. The shorter the geographical distances to the practice schools are, the more time can be saved. A coordinator can in this way help many more participants. One should, however, be conscious of the fact that the coordinator, whose role is completely indispensable to the activity, is not at present an "existent resource". Wholly without extra resources, it will then be totaly impossible to carry on any continued activity with the minicourse.

10.5 Final views

The report which is presented here has given an account of how the Swedish testing of the American minicourse 1: Effective questioning, has been shaped and executed, and which results have been arrived at, both in the case of observable behavioral alterations and of subjective experience of the subjects. There is perhaps reason in conclusion, to express some rather more general views about the minicourse and its consequences.

It is obvious that the course has met with very strongly positive acceptance from the student teachers. The reason for this is naturally that they have felt it to be a stimulating and meaning-

ful experience, and that they have been able to note positive changes in their own teaching behavior. This is, of course, gratifying but there is, perhaps, still reason to see both these positive effects and the course itself in a broader perspective.

Against the background of the more limited contribution, which the minicourse has made in the total teacher education, one must ask himself if it is really possible that these thirty hours of a three-year education can be of such superior value that the enthusiastic comments are justifiable. Even if it was enticing to answer yes to the question, it would be, of course, gravely unjust towards other parts of the education. One must be aware of the advantages that the minicourse has had. It means something completely new for the student teachers, because it gives them possibilities for videotaped feedback and self-analysis. It was presented at a time (during the practice-term) when the student teachers surely felt a great need of just this sort of graspable techniques, which the minicourse teaches. It met the demands which are often made in the teacher training for contents which are directly connected with reality. Teacher education is often criticized for beeing all too teoretical. The minicourse is remarkably concrete. All of these factors have been important and contributed to the good results. We also know from earlier research, e.g. Brusling (1974) that student teachers opinions on microteaching and self-confrontation often are very positive.

The minicourse means skill training. Is there a need for skill training in Swedish teacher education of today? Isn't it a step backwards in a time when steadily greater demands are being made that teacher education shall lead to personal growth, ability to cooperate, ability to establish good contacts with pupils, psychological and social insight etc. Strong argument speak against this assertion. It is, of course, without a doubt so that the teacher role to a great degree is and will be changing, and that the teachers' duties in the future are going to be to a lesser extent presenting fact information (Stukát 1970). There will,

however, always be a certain amount of "handicraft" in the teaching profession and this "handicraft" probably consists of different, rather easily identifiable skills. If a teacher has a command of these skills, that is, knows his job completely, resources can be liberated for other perhaps more important, and more difficult and subtle tasks. The skill training is therefore in no way a hinder to the student teachers´ developing a personal style of their own. The minicourse "Effective questioning" and it´s eventual successors can likely been seen as a very well motivated contribution to teacher education.

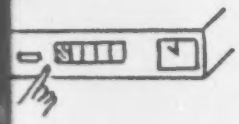
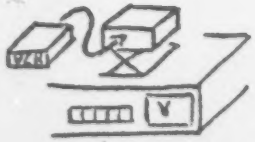
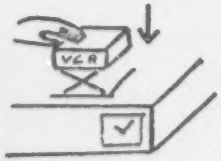
Appendix A

Technical equipment for the videotaping of lesson

Detailed description	Price Sw Cr	Weight	Technical comments
TV-cassette tape-recorder Philip N 1500	3.878	17 kg	Max playing time 60 min hor. resolutions > 200 lines
Mini-compact camera Philips LDH 50, AMR vidicon, XQ1030	2.000	3.5 kg	
Zoom-lens Canon V5x20, 20-100 mm, 1:2,5	1.250	0.5 kg	
Tripod Slick Master de luxe	480	3 kg	
Monitor Philips "Caddie" Z12T740	690	8 kg	
Microphone Philips LBB 900305	155		200 ohm, 10 m cabel, DIN standard
Ear-phones Ashidavox St-10/8 ohm	75		
Cabling	25		
Transport cases, 2	1.000	16 kg	
Sum (reduced price excl moms)	9.553	50 kg	

Supplier: Svenska Philips AB, Burggrevegatan 15, Box 441, S-401 16 Göteborg 1

Appendix B. An example from the 'Technical Operation Manual' by Ivar Hædde

	Measure	Fault - reason	Measure
			- still no picture - fault in replay cable (red), or default in the VCR. call coordinator!
			
	Recording		
36.	button "EJECT" on VCR pressed	button "EJECT" won't go down VCR turned on.	press "off"-button on top of VCR
			
37.	cassette is removed from its container and placed in cassette-lift	cassette does not go all the way into cassette-lift. cassette turned wrong way.	take out cassette and put it in again so that the words VCR are turned the right way and turned you.
			
38.	cassette-lift is pressed in	cassette-lift won't go all the way down cassette is not completely pressed into cassette-lift	press in the cassette so that it goes all the way down.

1. What is your general impression of the minicourse as a contribution to teacher education?

2. What did you derive most from in the minicourse?

3. What was not so good about the minicourse?

4. What improvements would you suggest?

5. Teacher educations practice-phase is going to be changed so that the practice term disappears. It will be replaced by continual practice periods distributed through all the terms of study. In this question - when do you think the minicourse should come in?

--- in the beginning
--- in the middle
--- at the end
--- as inservice training
--- at some other time. When? _____

6. Have you felt a need to receive views about your part in the recorded training periods from an outsider?

--- yes, from the supervisor
--- yes, from a methods teacher
--- yes, from a teacher in pedagogics
--- yes, from someone in the minicourse project group
--- yes, from a colleague
--- no, not at all

7. Has the minicourse been completely self-instructing - above and beyond the initial instruction?

--- yes, both in content and technically
--- yes, but only in content, not technically
--- yes, but only technically, not in content
--- no, I have needed help on the following points
.....
.....

8. Pupils have varying knowledge and general experience, which makes them more or less suitable to take part in the microteaching sessions. From what grade, in your opinion, can the pupils most suitably be taken for these sessions?

--- first grade
--- second grade
--- third grade
--- fourth grade
--- fifth grade
--- sixth grade
--- further suggestion

9. Do you think that profiting from the minicourse demands that you know the pupils who are to be micro-taught?

--- yes, this is a pre-requisite
--- yes, it is a pre-requisite for certain instructional sequences
--- no, but it is an advantage
--- no, it makes no difference

10. Within what part of the teacher training do you think the minicourse most naturally belongs?

--- pedagogics
--- methods courses
--- makes no difference
--- Other. Which?

MINICOURSE 1
Observer Record Forms 94
Pausing and Length of Pupil Responses

Appendix D:1

Inspeln.
nr:.....

Bedömare:.....

Datum:.....

Observationstid:..... min

1

Pausing Behavior (LOP = Length Of Pause, RV = Räkneverk)

	RV	LOP		RV	LOP		RV	LOP		RV	LOP		RV	LOP
1			11			21			31			41		
2			12			22			32			42		
3			13			23			33			43		
4			14			24			34			44		
5			15			25			35			45		
6			16			26			36			46		
7			17			27			37			47		
8			18			28			38			48		
9			19			29			39			49		
10			20			30			40			50		

1A
1B
1C
1D

A: Total number of teacher questions ..... B: Total zeros .....

C: Sum of pauses ..... D: Average (C/A) .....

NUMBER OF WORDS IN PUPIL REMARKS

	RV	NW		RV	NW		RV	NW		RV	NW		RV	NW
1			11			21			31			41		
2			12			22			32			42		
3			13			23			33			43		
4			14			24			34			44		
5			15			25			35			45		
6			16			26			36			46		
7			17			27			37			47		
8			18			28			38			48		
9			19			29			39			49		
10			20			30			40			50		

2A
2B
2C
2D

A: Total number of pupil remarks ..... B: Total words .....

Observationstid:..... min

1

Pausing Behavior (LOP = Length Of Pause, RV = Räkneverk)

	RV	LOP		RV	LOP		RV	LOP		RV	LOP		RV	LOP
1			11			21			31			41		
2			12			22			32			42		
3			13			23			33			43		
4			14			24			34			44		
5			15			25			35			45		
6			16			26			36			46		
7			17			27			37			47		
8			18			28			38			48		
9			19			29			39			49		
10			20			30			40			50		

1A
1B
1C
1D

A: Total number of teacher questions ..... B: Total zeros .....

C: Sum of pauses ..... D: Average (C/A) .....

NUMBER OF WORDS IN PUPIL REMARKS

	RV	NW		RV	NW		RV	NW		RV	NW		RV	NW
1			11			21			31			41		
2			12			22			32			42		
3			13			23			33			43		
4			14			24			34			44		
5			15			25			35			45		
6			16			26			36			46		
7			17			27			37			47		
8			18			28			38			48		
9			19			29			39			49		
10			20			30			40			50		

2A
2B
2C
2D

A: Total number of pupil remarks ..... B: Total words .....

C: Average words per remark (B/A) ..... Number of 1-word remarks ...

MINICOURSE 1

OBSERVER RECORD FORM

Locating Incorrect Responses

Appendix D:2

Inspeln. nr:.....

Bedömare:.....

Datum:.....

Observationstid:..... min

2

Instructions

One of our goals is to see how teachers handle incorrect pupil responses. When running the tapes to locate the three negative behaviors, also watch for incorrect pupil responses. This is defined as any response the teacher reacts to as an incorrect response by telling the pupil he is wrong, passing on to another pupil, etc. Do not try to judge the factual correctness of responses. When in doubt, record the episode and we will decide on it later.

Be sure to start the counter at zero. At each incorrect response stop the recorder and enter counter number on this form.

Incorrect Response	Counter Number	Classification	Incorrect Response	Counter Number	Classification
1			11		
2			12		
3			13		
4			14		
5			15		
6			16		
7			17		
8			18		
9			19		
10			20		

2:1

2:2

2:3

2:4

2:5

Summary

1_____ 2_____ 3_____ 4_____ 5_____ TOTAL _____

Observer Record Form

Redirection

Appendix D:3

Inspeln.
nr:.....

Bedömare:.....

Datum:.....

Observationstid:..... min

3

Tally

T

REDIRECTION

Comments

MINICOURSE 1
Observer Record Form
Higher Cognitive Questions

Appendix D:4

Inspeln.
nr:.....

Bedömare:.....

Datum:.....

Observationstid:..... min

4

		Tally	Total	
A.	Fact Questions			4A
B.	Higher Cognitive Questions			4B
C.	All Questions (A+B)			4C

Summary

Total proportion of fact questions $\left(\frac{A}{C}\right)$ _____ 4D

MINIKURS I

Prompting, further clarification, refocusing

Appendix D:5

Inspeln. nr:.....

Bedömare:.....

Datum:.....

Observationstid:..... min

5

Instructions: Start tape and run until a teacher probing behavior occurs. Stop tape. Decide if behavior is prompting (P), seeking further clarification (C), or refocusing (R). Circle appropriate letter after "1". Restart tape and run to next probing behavior. Identify behavior, circle appropriate letter after "2". Continue in this manner to end of tape.

1.	P	C	R	18.	P	C	R	35.	P	C	R		
2.	P	C	R	19.	P	C	R	36.	P	C	R		
3.	P	C	R	20.	P	C	R	37.	P	C	R		
4.	P	C	R	21.	P	C	R	38.	P	C	R		
5.	P	C	R	22.	P	C	R	39.	P	C	R		
6.	P	C	R	23.	P	C	R	40.	P	C	R		
7.	P	C	R	24.	P	C	R	41.	P	C	R		
8.	P	C	R	25.	P	C	R	42.	P	C	R		
9.	P	C	R	26.	P	C	R	43.	P	C	R		
10.	P	C	R	27.	P	C	R	44.	P	C	R		
11.	P	C	R	28.	P	C	R	45.	P	C	R		
12.	P	C	R	29.	P	C	R	46.	P	C	R		
13.	P	C	R	30.	P	C	R	47.	P	C	R		
14.	P	C	R	31.	P	C	R	48.	P	C	R		
15.	P	C	R	32.	P	C	R	49.	P	C	R		
16.	P	C	R	33.	P	C	R	50.	P	C	R		
17.	P	C	R	34.	P	C	R						

Totals:

Prompting	_____	_____
Further Clarification	_____	_____
Refocusing	_____	_____

Check here if all or a major part of tape has very bad sound or picture _____.

Comments: _____

_____

_____

MINICOURSE 1

OBSERVER RECORD FORM

NEGATIVE BEHAVIORS

Inspeln. nr:.....

Bedömare:.....

Datum:.....

Observationstid:..... min

6

		Tally	Total
1.	Teacher repeats own questions		
2.	Teacher answers own questions		
3.	Teacher repeats pupil answers		

Check here if all or a major part of tape has very bad sound or picture ____.

Comments: _____

MINIKURS 1.

Procent lärartal

Inspeln.
nr:.....

Bedömare:.....

Datum:.....

Observationstid:..... min

7

Tid lärartal .....min .....sek = ...sek

Total tid .....min .....sek = ...sek

Procent lärartal .....

Certain completing rules of coding the minicourse variables

The basic principle for the analyses of the pre- and post-recordings has been, that the skills observed should follow the instructions of the minicourse. Since the aim of the course is to get pupils, who are not verbally active, to participate in discussions and contribute with points of view of their own, only skills which aim at making the individual pupil more active, have been coded. Besides, the Evaluation manual (Borg --) has been the basis of the analysis. The reason for this is that the studies of transferability should be made possible. Below are certain rules, which have completed the manual at the Swedish analyses.

Redirection. Should be coded with great restrictivity and only when the student teacher actively uses the skill. Is not coded at a spontaneous pupil discussion, which the student teacher accepts with a "let-go".

Time for teacher talk. The chronometer is stopped even at short pauses in the teacher talk (This will make interobserver agreement higher).

Pausing. Measure the time that passes from the framing of a question to the direction of it to someone. The question is directed to a pupil when the teacher says a pupil's name, calls the pupil in other words, or with gestures or such vizualises to the pupil that he wants an answer. If a pupil answers or says something spontaneously, the time measuring stops. At redirection, measure the pause before the first pupil response. A question is coded only when it is directed to the whole class (i.e. not at the probing techniques). If the answer to a question is just raising the hand, the question is not coded.

Number of words per pupil response. Only those pupil responses are coded, which have connection to the question or to the topic of discussion. Answers with no connection to the topic are not coded.

Do not code if pupil responds with no answer (if pupil cannot answer the question that has been directed to time).

Pupil response is coded as coherent if comments from the teacher (e.g. hm, yes, good etc) does not disturb the pupil's answer. If the teacher's comment influences or guides the answer, two answers should be coded. Pupil response can be a question if this question is connected to the topic. "I didn't hear" etc is not coded, as it is considered as an "administrative" question. If it is difficult to decide wether a question is administrative or not, the question should be counted as a connected question and be coded.

Reaction to incorrect pupil response.

1. Non-punitive, accepting reaction to pupil response.
2. Punitive, non-accepting reaction to incorrect pupil response.

(This classification does not follow the American Evaluation Manual. Instead, each incorrect pupil response has been registered and the teacher's reaction to this response has been coded according to the above classification, which follows the instructions given in the teacher handbook and the instructional lesson).

Prompting. The behavior is coded only if the pupil response is incorrect or weak and the student teacher consciously is prompting in order to get a complete answer. To be able to prompt, the student teacher must ask a question, to which a criterion response can be expected. Otherwise no prompts can be given. The prompting shall be directed to one pupil, not to the entire class. The behavior is coded restrictively.

Further clarification. Is coded only if the student teacher is probing by saying e.g. Why, Explain, Clarify etc. The pupil must have given an answer. Is coded only if the same pupil, who was asked, gives an incorrect or weak answer.

Refocusing. The behavior is rare and easy to forget, when it is coded together with other skills.

SUB-PROBLEM NUMBER I CONTAINS 64 CASES SEPARATE VARIANCE ESTIMATE

Variable		Number of cases	Mean	Standard Deviation	T Value	Degrees of freedom	P Value
Total number of questions from teacher	Post	32	26.4456	9.798	0.77	51.53	0.445
	Pre	32	24.6453	8.975			
Number of questions without pause	Post	32	0.3239	0.804	-2.15	38.51	0.038
	Pre	32	1.2487	2.293			
Total length of teacher pauses (in seconds)	Post	32	92.0789	31.416*	6.57	59.54	0.000
	Pre	32	45.0711	25.558			
Average length of teacher pauses (in seconds)	Post	32	3.7153	1.375	6.70	46.59	0.000
	Pre	32	1.8789	0.714			
Total number of pupil responses	Post	32	65.4461	14.453	0.30	54.62	0.764
	Pre	32	64.0774	21.253			

* Significant difference from the normal distribution by Geary's test.

Appendix F. t-test of the difference between pre- and post-means for the experiment group

SUB-PROBLEM NUMBER I CONTAINS 64 CASES — SEPARATE VARIANCE ESTIMATE

Variable		Number of cases	Mean	Standard Deviation	T Value	Degrees of freedom	P Value
Average number of words per pupil response	Post	32	9.1898	4.895	-1.31	60.48	0.196
	Pre	32	10.9325	5.743*			
Number of one-word pupil responses	Post	32	12.5452	7.854	0.09	58.46	0.931
	Pre	32	12.3498	10.096			
Non-punitive reaction to incorrect pupil response	Post	32	1.3915	1.778	2.67	47.81	0.010
	Pre	32	0.4362	0.965			
Punitive reaction to incorrect pupil response	Post	32	0.7165	1.201	-0.13	59.88	0.893
	Pre	32	0.7614	1.453			
Redirection	Post	32	31.7539	15.336	2.22	61.95	0.030
	Pre	32	23.1133	15.773			

* Significant difference from the normal distribution by Geory's test.

Appendix F. t-test of the difference between pre- and post-means for the experiment group

SUB-PROBLEM NUMBER 1 CONTAINS 64 CASES — SEPARATE VARIANCE ESTIMATE

Variable	Number of cases	Mean	Standard Deviation	T Value	Degrees of freedom	P Value
Number of fact questions	Post 32	16.5199	9.211	1.64	61.19	0.106
	Pre 32	12.5038	10.337 *			
Number of higher cognitive questions	Post 32	15.5815	8.066	-0.98	60.70	0.330
	Pre 32	17.4292				
Proportion of factquestims	Post 32	0.4948	0.235	2.13	60.51	0.037
	Pre 32	0.3783	0.201			
Prompting	Post 32	3.4954	4.620	2.95	39.57	0.005
	Pre 32	0.9226	1.734			
Asking for further clarification	Post 32	4.7688	3.527	1.12	51.31	0.268
	Pre 32	3.7257	3.923			

* Significant difference from the normal distribution

Appendix F. t-test of the difference between pre- and post-means for the experiment group

SUB-PROBLEM NUMBER I CONTAINS 64 CASES SEPARATE VARIANCE ESTIMATE

Variable		Number of cases	Mean	Standard Deviation	T Value	Degrees of freedom	P Value
Refocusing	Post	32	0.0372	0.210	1.00	31.00	0.325
	Pre	32	-0.0	-0.0 *			
Teacher repeats his/her own questions	Post	32	2.9178	2.535	-0.92	50.73	0.363
	Pre	32	3.7181	4.230			
Teacher answers his/her own questions	Post	32	0.2156	0.499	-1.28	40.88	0.206
	Pre	32	0.5175	1.233			
Teacher repeats pupil answers	Post	32	2.5880	4.108	-4.11	44.64	0.000
	Pre	32	9.4703	8.533			
Proportion of teacher talk	Post	32	27.4830	7.573	-3.79	51.05	0.000
	Pre	32	37.2659	12.503			

* significant difference from the normal distribution by Geary's test

Appendix F. t-test of the difference between pre- and post-means for the experiment group

SUB-PROBLEM NUMBER 1 CONTAINS 64 CASES — SEPARATE VARIANCE ESTIMATE

Variable		Number of cases	Mean	Standard Deviation	T Value	Degrees of freedom	P Value
Total number of questions from teacher	Post	10	21.7230	5.908	0.15	15.14	0.886
	Pre	10	21.2122	9.415			
Number of questions without pause	Post	10	0.8313	1.636	0.47	14.20	0.649
	Pre	10	0.5549	0.922			
Total length of teacher pauses (in seconds)	Post	10	38.4100	15.033*	-0.63	12.65	0.543
	Pre	10	45.9039	34.412			
Average length of teacher pauses (in seconds)	Post	10	1.8637	0.772	-0.47	17.90	0.644
	Pre	10	2.0327	0.832			
Total number of pupil responses	Post	10	53.0619	12.991	1.07	18.00	0.298
	Pre	10	46.7789	13.204			

* Significant difference from the normal distribution by Geary's test

Appendix F. t-test of the difference between pre- and post-means for the control group

SUB-PROBLEM NUMBER I CONTAINS 64 CASES — SEPARATE VARIANCE ESTIMATE

Variable		Number of cases	Mean	Standard Deviation	T Value	Degrees of freedom	P Value
Average number of words per pupil response	Post	10	13.4764	6.534 *	0.90	17.61	0.380
	Pre	10	11.0174	5.625 *			
Number of one-word pupil responses	Post	10	7.2450	4.693	-0.79	15.67	0.440
	Pre	10	9.3688	7.048			
Non-punitive reaction to incorrect pupil response	Post	10	0.7112	1.233	1.82	9.00	0.102
	Pre	10	-0.0	-0.0 *			
Punitive reaction to incorrect pupil response	Post	10	1.6137	2.771	1.02	14.13	0.326
	Pre	10	0.5926	1.549 *			
Redirection	Post	10	13.8258	9.590	-0.09	16.32	0.930
	Pre	10	14.1599	6.878			

* Significant difference from the normal distribution by Geary's test

Appendix F. t-test of the difference between pre- and post-means for the control group

SUB-PROBLEM NUMBER I CONTAINS 64 CASES — SEPARATE VARIANCE ESTIMATE

Variable		Number of cases	Mean	Standard Deviation	T Value	Degrees of freedom	P Value
Number of fact questions	Post	10	11.7642	8.745	0.64	16.99	0.531
	Pre	10	9.5184	6.815			
Number of higher cognitive questions	Post	10	12.9225	6.461	-0.41	17.80	0.690
	Pre	10	14.1607	7.179*			
Proportion of fact questions	Post	10	0.4503	0.296	0.73	14.96	0.479
	Pre	10	0.3703	0.182*			
Prompting	Post	10	0.6785	0.551	-1.15	13.42	0.272
	Pre	10	0.7168	1.075			
Asking for further clarification	Post	10	2.7869	2.787	0.74	17.10	0.469
	Pre	10	1.9534	2.206			

* Significant difference from the normal distribution by Geary's test

Appendix F. t-test of the difference between pre- and post-means for the control group

SUB-PROBLEM NUMBER I CONTAINS 64 CASES — SEPARATE VARIANCE ESTIMATE

Variable		Number of cases	Mean	Standard Deviation	T Value	Degrees of freedom	P Value
Refocusing	Post	10	-0.0	-0.0 x	-0.0	-0.0	1.000
	Pre	10	-0.0	-0.0 x			
Teacher repeats his/her own questions	Post	10	3.4925	2.178	-0.86	16.80	0.402
	Pre	10	4.2377	1.656			
Teacher answers his/her own questions	Post	10	1.2812	2.217	1.12	10.36	0.288
	Pre	10	0.4645	0.612 x			
Teacher repeats pupil answers	Post	10	8.3400	5.302	-0.65	17.55	0.527
	Pre	10	10.0134	6.233			
Proportion of teacher talks	Post	10	38.3060	9.011	-1.37	17.67	0.189
	Pre	10	44.2380	10.332			

x Significant difference from the normal distribution by Geary's test

Appendix F. t-test of the difference between pre- and post-means for the control group

REFERENCES

Bellack et al
1966 The language of the classroom. New York City: Teachers College Press

Biomedical computer programs
1971 BMD, Dixon, W.J. (ed) Health Sciences Computing Facility, University of California, Los Angeles, California 90024, March

Borg, W.R.
1971 Scoring Minicourse 1 pre- and post videotapes. Evaluation manual B71-1, Far West Laboratory for Educational Research and Development. Mimeograph

Borg, W.R., Kelley, M.L., Langer, P. & Gall, M.
1970 The Minicourse: A microteaching approach to teacher education. Macmillan Educ. Serv. Inc., California

Bredänge, G. & Odhagen, T.
1972 Didaktisk processanalys. Ett studium av lärar- och elevbeteenden i klassrumssituationen. Pedagogiska institutionen. Lärarhögskolan i Göteborg. Rapport nr 28, April

Bredänge, G. et al
1971 Didaktisk processanalys. Pedagogiska institutionen, Lärarhögskolan i Göteborg, rapport nr 24, November

Brusling, C.
1974 Microteaching: A concept in development. Almqvist & Wiksell International, Stockholm/Sweden

Brusling, C. & Tingsell, J.-G.
1973 Self-observation and self-analysis in teacher training. Department of educational research, Gothenburg School of Education, research bulletin No. 14. April

CERI/TLS
1972 Transfer of curriculum development projects and learning systems. Mimeograph

Cramer, E.M.
1967 "Revised MANOVA program". The L.L. Thurstone Psychometric Laboratory, The University of North Carolina, Chapel Hill, North Carolina

Flanders, N.A.
1970 Analysing teaching behavior. Addison-Wesley Publishing Company, 2052

Heyns, R. W. & Lippitt, R.
1954 Handbook of social psychology (Gardner & Lindsey, Ed) Addison Wesley Publishing Company

Läroplan för grundskolan (*The curriculum* for the compulsory school)
1969 SÖ-förlaget, Stockholm

Stukát, K. -G.
1970 Teacher role in change. Department of Educational research. Gothenburg School of Education, Research Bulletin No. 4. October

Utbildningsplan för klasslärarlinjer vid Lärarhögskola. (Plan of Education for Swedish Teacher Training)
1971 SÖ-förlaget, Stockholm